

EARLY SCHOOL ADJUSTMENT:  
CONTRIBUTIONS OF CHILDREN'S EMOTION SELF-REGULATION  
AND CLASSROOM INSTRUCTIONAL AND EMOTIONAL SUPPORTS

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## **ABSTRACT**

**PATRICIA R. SYLVESTER: Early School Adjustment: Contributions of Children's Emotion Self-regulation and Classroom Supports**  
(Under the direction of Judith L. Meece)

This study examined social competence as mediator of emotion self-regulation's association with academic achievement and whether classroom supports moderated emotion self-regulation's associations with social competence and academic achievement. Participants were 740 first-graders from a national prospective study. This study found that well regulated preschoolers became socially competent and academically successful first-graders. Social competence did not mediate emotion self-regulation's association with academic achievement. Instructional support did not moderate emotion self-regulation's association with academic achievement. Emotional support did not moderate emotion self-regulation's association with social competence. Emotional support moderated emotion self-regulation's association with academic achievement, but had a generally deleterious affect. This study's findings stress the importance of emotion self-regulation to early school adjustment and raise questions concerning effects of classroom supports.

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## CHAPTER I

### INTRODUCTION

For most American children the transition to school comes between the ages of four and seven. Regardless of age, starting school brings dramatic changes to the lives of young children. Often part of larger elementary schools, primary classrooms make new cognitive demands, have higher adult-child ratios than home or preschool (Ladd, 1996), and may not reflect children's home cultures (Delpit, 1995). At school, children spend increased time in the company of peers, with whom they are expected to work cooperatively and with whom they must compete for adult attention, peer companionship, and use of equipment and materials (Entwisle & Alexander, 1998).

To succeed during this transition, children must learn school and classroom regulations and procedures, find ways to get along with classmates and teachers, develop necessary learning strategies, and define themselves as students (Entwisle & Alexander, 1998; Entwisle & Hayduk, 1988). Children who have difficulties adjusting during this transition are at risk for developing subsequent academic and social problems at school (Entwisle & Alexander, 1999; Hamre & Pianta, 2001; Ladd & Burgess, 1999). Thus, the transition to school has both immediate and long-term consequences.

Given the importance of the transition to elementary school, research has focused on child and classroom characteristics that enhance early school adjustment. According to American teachers, school adjustment depends in great measure on appropriate classroom behavior.

Following directions, participating enthusiastically and cooperatively, and getting along well with classmates are regarded by teachers as more important than having basic academic skills for successful early school adjustment (Lewit & Baker, 1995; Rimm-Kaufman, Pianta, & Cox, 2000). Research suggests that such behaviors, along with social and academic indicators of early school adjustment, are associated with emotion self-regulation (Calkins & Howse, 2004; Eisenberg, Fabes, Guthrie, & Reiser, 2000; Fabes, Martin, Hanish, Anders, & Madden-Deredich, 2003; Howse, Lange, Farran, & Boyles, 2003a; Vandell & Hembree, 1994; Welsh, Parke, Widaman, & O'Neil, 2001).

Developmental research has also emphasized the importance of children's classroom experiences to early school adjustment. However, research examining direct effects of classroom experiences has been inconclusive. Researchers have studied the influence of teacher-centered versus child-centered instructional approaches and teacher-child relationships. In general, the results show that neither high levels of teacher-delivered instruction nor frequent opportunities for children to select learning activities has consistently been associated with successful adjustment (Pianta, La Paro, Payne, Cox, & Bradley, 2002; Rimm-Kaufman, La Paro, Downer, & Pianta, 2005; Stipek et al., 1998; Stipek, Feiler, Daniels, & Milburn, 1995). Close relationships with teachers appear unlikely to enhance adjustment, but teacher-child conflict has often been associated with its diminution (Birch & Ladd, 1997; Hamre & Pianta, 2001; Ladd, Birch, & Buhs, 1999; Pianta & Stuhlman, 2004). Recently, an interactive ecological model (Lerner, 2002) of early school adjustment has been examined. Findings from this research demonstrate that specific classroom experiences are important for some, but not all, children (Burchinal, Peiser-Feinberg, Pianta, & Howes, 2002; Meehan, Hughes, & Cavell, 2003). For example, Hamre and Pianta (2005) have reported

that children who exhibit behavior problems have lower achievement, but, in classrooms where teachers provide high levels of emotional support, such children's achievement is commensurate with that of their peers.

Although research has extended the knowledge base on the transition to school, a number of questions remain. Of interest for this dissertation study were questions concerning the role of emotion self-regulation in school adjustment. Does early emotion self-regulation directly influence first-grade academic achievement or is its influence mediated by first-grade peer-related social competence? Research suggests that emotion self-regulation contributes to peer-related social competence and academic achievement (Fantuzzo, Bulotsky, McDermott, Mosca, & Lutz, 2003; Howse, Calkins, Anastopoulos, Keane, & Shelton, 2003b). Peer-related social competence has also been associated with academic achievement (Capara, Barbaranelli, Pastorelli, Bandura, & Zimbardo, 2000; Ladd et al., 1999). Disentangling the contributions of emotion self-regulation and peer-related social competence to academic achievement should clarify their relative importance. Another question of interest concerns the classroom environment. How do classroom experiences influence first-grade school adjustment? Classroom processes may moderate the influences of emotion self-regulation on early school adjustment. Because school trajectories are often established in the primary grades (Alexander & Entwisle, 1988; Entwisle & Alexander, 1998), it is crucial to understand mechanisms underlying early school adjustment. This study has the potential to further the understanding of how, during the transition to elementary school, some children successfully become students while others do not.

### *Purpose of the Study*

The primary purpose of this study was to examine the role of early emotion self-regulation in predicting first-grade school adjustment. For the purposes of this study, emotion self-regulation was defined as voluntary, conscious, and contextually appropriate efforts to control emotional processes and related behaviors (Calkins & Howse, 2004; Eisenberg & Spinrad, 2004). Two indicators of first-grade school adjustment, peer-related social competence and academic achievement (Perry & Weinstein, 1998), were examined. Peer-related social competence was defined as behaviors that support the initiation and maintenance of positive peer relationships (Howes & James, 2004). Academic achievement was defined as children's mastery of basic reading and mathematics skills (Alexander & Entwisle, 1988, p. 5).

The primary hypothesis of this study focused on peer-related social competence as a mediator of emotion self-regulation's contribution to first-grade academic achievement. As described later, it was predicted that peer-related social competence and academic achievement have a common origin in emotion self-regulation. More competent emotion self-regulation was, therefore, expected to be positively associated with greater peer-related social competence (Eisenberg et al., 2000; Raver, Blackburn, & Bancroft, 1999) and with higher levels of academic achievement (Howse et al., 2003a; Martin, Drew, Gaddis, & Moseley, 1988). Also, greater peer-related social competence was expected to be positively associated with higher levels of academic achievement (Ladd et al., 1999; Vandell & Hembree, 1994). However, there was no hypothesis concerning peer-related social competence as mediator of the association of emotion self-regulation and academic achievement.

Another purpose of this study was to examine classroom processes as moderators of emotion self-regulation's associations with peer-related social competence and academic achievement. For this study, classroom processes were defined as teachers' classroom activities and attitudes related to children's school adjustment (Rimm-Kaufman et al., 2005). Prior research has identified and demonstrated the importance of two classroom processes in the early elementary grades: instructional support and emotional support (Hamre & Pianta, 2005; NICHD Early Child Care Research Network, 2002). Instructional support was defined as teacher-child interactions and communications focused on academic instruction. Emotional support was defined as teacher sensitivity and responsiveness, along with classroom management and overall classroom emotional climate.

Two hypotheses, one related to instructional support and one to emotional support, were tested. Instructional support was not expected to moderate the relation of emotion self-regulation and academic achievement (Hamre & Pianta, 2005). Less well regulated children were not expected to have higher levels of academic achievement even when they were enrolled in classrooms that provided higher levels of instructional support. Emotional support was expected to moderate the relation of emotion self-regulation to peer-related social competence and to academic achievement (NICHD Early Child Care Research Network, 2002). With higher levels of emotional support, less well regulated children were expected to exhibit peer-related social competence and academic achievement commensurate with their peers. Better regulated children were not expected to benefit significantly from higher levels of emotional support.

Examination of the above hypotheses involved a secondary analysis of the National Institute of Child Health and Human Development Study of Early Child Care (NICHD

SECC) Phase I and Phase II data. These data provide a large, diverse sample of young children followed from birth through their second year of school. Included in the data are multiple measures of characteristics of children and their environments. Because this study involved latent constructs, unobservable characteristics inferred from observable behaviors and presumed to underlie those behaviors (Kerlinger & Lee, 2000, p. 54), multiple observed variables were needed to delineate each latent construct (Thompson, 2004). The data provide multiple, reliable measures of emotion self-regulation at 54-months, first-grade peer-related social competence and academic achievement. Instructional support and emotional support were derived from observed, qualitative ratings of classrooms and teachers.

In summary, using the NICHD SECC Phase I and Phase II data, this study first examined the role of early emotion self-regulation in predicting first-grade peer-related social competence and academic achievement. Next, the possibility that peer-related social competence mediated the association of early emotion self-regulation and first-grade academic achievement was also examined. Finally, classroom influences were examined as possible moderators of the associations among early emotion self-regulation, peer-related social competence, and academic achievement.

### *Theoretical Framework*

The theoretical framework guiding this study was drawn from ecologically oriented systems theory (Bronfenbrenner & Morris, 1998; Ford & Lerner, 1992; Rimm-Kaufman & Pianta, 2000). An important assertion of this theory is that children develop within a dynamic, nested set of systems. At the center of these systems are children's own traits, abilities, and characteristics that shape their behaviors. In turn, these behaviors affect how environmental influences, including parents, teachers, and peers, respond to them. Another

important tenet of ecological theory is that, with development, children enter new environments where they assume new roles, engage in new activities, and form new relationships. According to Bronfenbrenner (1979), this expanded “participation sets the necessary conditions for human development to take place” (p. 288). Ecologically oriented systems theory argues that, while new environments set the stage for development, it is proximal processes within the environment that are the primary mechanisms of development. Proximal processes can be defined as children’s interactions with objects, symbols, and other people in the immediate environment that occur regularly over an extended period of time (Bronfenbrenner & Morris, 1998). In primary classrooms, many enduring interactions, or proximal processes, are likely related to academic instruction and children’s learning, along with interactions concerning children’s classroom behaviors. Additionally, ecologically oriented theory argues that the effect of proximal processes vary from child to child. In fact, Bronfenbrenner (1979) stated, “[I]n ecological research, the principal main effects are likely to be interactions” (p. 38, italics in original). Thus, children’s early school adjustment was expected to be associated not only with characteristics of the children themselves, but also with the interactions of those characteristics and classroom proximal processes.

The transition to school brings many dramatic environmental changes which may challenge children’s abilities. Among these changes are the imposition of school agendas and schedules, along with the constant presence of peers. From the perspective of ecologically oriented systems theory, these environmental changes, in conjunction with children’s existing abilities, have the potential to initiate developmental transformations. One anticipated transformation is in children’s behavior patterns as new school behaviors associated with early school adjustment emerge. For the purposes of this study, school

adjustment was defined as peer-related social competence and academic achievement. It was hypothesized that children's early emotion self-regulatory abilities play an important role in social and learning processes at school. However, there are multiple pathways by which emotion self-regulation might wield its influence. First, emotion self-regulation may directly affect peer-related social competence. In turn, peer-related social competence may affect academic achievement, mediating emotion self-regulation's influence on academic achievement. Second, emotion self-regulation may independently influence the development of peer-related social competence and academic achievement. In this instance, there would be no causal relation between peer-related social competence and academic achievement. Additionally, regardless of the pathway by which emotion self-regulation may influence facets of early school adjustment, classroom processes were also expected to affect children's emotion self-regulation. Thus, emotion self-regulation's influence on early school adjustment was expected to be moderated by the influence of classroom processes. Theoretical support for each of these pathways is discussed below.

*Contributions of Emotion Self-Regulation to Early School Adjustment: Two Pathways*

Well established by school entry (Kochanska & Knaack, 2003; Sroufe, 1997), early emotion self-regulation was expected to influence school behavior patterns and, thus, academic achievement. For the purposes of this study, academic achievement was defined as the acquisition of basic reading and mathematics skills. To benefit from classroom instruction, children must spend time engaged in learning activities (Berliner, 1988; Bohn, Roehrig, & Pressley, 2004). Frequent interruptions and interesting off-task possibilities of busy classrooms may make staying on task difficult. Mastering complex new skills and acquiring new knowledge may challenge many students (Birch & Ladd, 1996). Teachers'



evaluative feedback, classmates' critiques, and children's own comparisons of their abilities and achievement with those of classmates (Ladd, 1996; Ladd, Buhs, & Troop, 2004) can have an important influence on children in this new social environment. Research has identified associations between emotion self-regulation and early school behaviors (Eisenberg et al., 2004a; Fantuzzo, Perry, & McDermott, 2004; Oppen, 2003). Well regulated children are able to remain focused, use feedback to change behaviors, cope constructively with criticism, and successfully manage the changing demands of the classroom (Bronson, 2000; Oppen, 2003). Thus, they are expected to do well academically. Predominately successful learning experiences encourage the continuance of the behavior patterns, thereby furthering achievement. Less well-regulated children, on the other hand, may find it more difficult to attend teacher instruction, persist at teacher-assigned tasks, and stay focused during group activities. Research suggests that less well regulated children experience greater challenges maintaining the levels of engagement necessary for learning (Calkins & Howse, 2004; Fantuzzo et al., 2004). Accordingly, differences in children's emotion self-regulation were expected to influence school behavior patterns and academic achievement.

Early emotion self-regulation may also affect academic achievement through its influence on peer-related social competence. Better regulated children, who cooperate with classmates, share equipment and attention, and maintain positive demeanors, are likely to get along well with most peers, earning their positive regard. These well-liked children, feeling accepted and comfortable at school, may engage fully in classroom activities, (Ladd & Kochenderfer, 1996) and, thus, learn more (Ladd, Kochenderfer, & Coleman, 1997). During peer interactions, children may also encourage, learn from, and provide security for one another

(Parker & Asher, 1989). These aspects of peer relationships have the potential to support children's academic engagement and learning. On the other hand, less well regulated children, experiencing difficulty following school rules and procedures, may tax classroom resources, and disrupt the life of the classroom. Many children become intolerant of these poorly regulated peers (Eisenberg et al., 2000; Hubbard & Dearing, 2004). When children are not accepted by peers, they may feel alienated and unhappy, come to dislike school, and disengage from learning (Ladd, 1990; Ladd et al., 1999; Welsh et al., 2001). Additionally, peer interactions that encourage off-task activities, support negative behaviors and attitudes, and provide security in exclusivity, could compromise academic engagement and learning. Thus, it is possible that peer-related social competence may mediate the association between emotion self-regulation and academic achievement.

It is also possible that peer-related social competence and academic achievement develop concurrently. Peer-related social competence and academic achievement, with common roots in early emotion self-regulation, may have no causal association. During the transition to school, many children are acquiring more effective strategies for accessing environmental resources (Hawley, 1999). In the classroom, there are both academic and social resources. Academic resources include instruction, learning activities, and use of equipment and materials. Social resources include peer relationships, inclusion in peer activities, and peer regard. Better regulated children may acquire sophisticated, cooperative strategies, such as exchanging favors, cooperating with and considering the desires of others, and adhering to school rules (Hawley, 2003), more easily and earlier than their less well regulated peers. These more competent strategies may facilitate greater access to academic and social resources at school. Better regulated children, using more competent resource control

strategies are, therefore, likely to access classroom academic and social resources more fully, learning more and having better peer relationships than their less well regulated classmates. If this is the case, academic achievement and peer-related social competence would be covarying, concurrent outcomes of early emotion self-regulation.

#### *Contributions of Classroom Proximal Processes to Early School Adjustment*

From the perspective of ecologically oriented systems theory, children's emotion self-regulation is expected to interact with teachers' instructional practices to influence school behavior patterns and, thus, early school adjustment. Learning opportunities depend on the quality of classroom instructional support. Good instructional support includes frequent instruction, feedback focused on developing understanding, open-ended questions, and encouragement of student responsibility (Hamre & Pianta, 2005). Better regulated children should attend to instruction more closely, use feedback more effectively, and need less teacher support to learn. Less well regulated children, more often off-task and less able to use feedback, may not benefit from high levels of instructional support. For example, Hamre and Pianta (2005) reported that instructional support did not significantly improve the academic achievement of children who exhibited externalizing behavior problems. For these reasons, instructional support was not expected to moderate early emotion self-regulation's influence on academic achievement.

Learning also depends on the classroom emotional climate. In very emotionally supportive classrooms, teachers clearly define classroom rules and procedures, proactively manage student behavior, appropriately differentiate expectations and instructions, show pride in children's accomplishments, and teach constructive coping strategies (Hamre & Pianta, 2005). For less well regulated children, higher levels of emotional support may help

students understand and follow rules and procedures, provide opportunities for success, and minimize failure. In this way, high levels of emotional support may bolster children's emotion self-regulation and diminish school challenges to it. Thus, in emotionally supportive classrooms, less well regulated children have more opportunities to develop school behavior patterns associated with social and academic success than they would in less emotionally supportive classrooms. For these reasons, emotional support was expected to moderate early emotion self-regulation's influence on peer-related social competence and academic achievement.

In summary, the transition to school places new demands on children's emotion self-regulation. Research has indicated emotion self-regulation has important influences on both peer-related social competence and academic achievement. However, the precise pathway of this influence has been unclear. This study explored the influence of emotion self-regulation on both peer-related social competence and academic achievement. It also explored the possibility that the influence of emotion self-regulation on academic achievement was indirect, mediated by its influence on peer-related social competence. Furthermore, this study examined the moderating influence of classroom processes on these relations. Previously, research had not examined these associations.

## CHAPTER II

### LITERATURE REVIEW

Research suggests that children's adjustment during the transition to school has both immediate and long-term consequences (Entwisle & Hayduk, 1988; Hamre & Pianta, 2001). It is, therefore, essential to define child characteristics and classroom processes that influence early school adjustment and to describe mechanisms by which they wield influence. Defining early school adjustment using children's academic achievement and social competence (Perry & Weinstein, 1998), research has sought child characteristics and classroom processes related to successful adjustment (Alexander & Entwisle, 1988; Ladd, 1996; Rimm-Kaufman et al., 2005). Additionally, ecologically-oriented research has examined complex interactions of child characteristics and classroom processes associated with successful adjustment. These interactions reveal the importance of specific classroom processes for some, but not all, children (Connor, Morrison, & Katch, in press; Silver, Measelle, Armstrong, & Essex, 2005). The purpose of this literature review is two-fold. First, research examining emotion self-regulation's association with academic and social aspects of early school adjustment is reviewed. Next, research concerned with the association of peer-related social competence and academic achievement is reviewed. Then, the possibility that peer-related social competence mediates emotion self-regulation's association with academic achievement is considered. Finally, research examining

associations of two classroom processes, instructional support and emotional support, and early school adjustment is reviewed.

For this literature review, it was important to select studies using measures congruent with those of the proposed study. Thus, the review focuses on studies involving children in late preschool and early elementary school who are, in age, similar to children at the transition to school. Studies that assessed academic achievement using achievement test scores, report card grades, and teachers' reports have been included. Stringent criteria were used to select research examining associations of child characteristics and early school adjustment. Only studies that assessed emotion self-regulation using attention control and behavioral inhibition have been included. Studies that assessed peer-related social competence using adult or peer reports of children's socially competent behaviors were included, but peer reports of social status and friendship were not included. Less stringent criteria were used when selecting research examining associations of classroom processes and early school adjustment. Studies that assessed instructional support using observations and teachers' reports of classroom instructional practices have been included. Studies that assessed emotional supports using close, positive teacher-child relationships and interactions as well as qualitative ratings of emotional support have been included.

The first section of this review discusses research that examined associations of child characteristics and early school adjustment. Within this section, associations between emotion self-regulation and academic achievement are considered first. Then associations between emotion self-regulation and peer-related social competence are discussed.

The following two sections are concerned with the role of peer-related social competence in children's academic achievement. Research examining peer-related social competence's

association with academic achievement is reviewed in the first of these sections. The subsequent section considers peer-related social competence as a possible mediator of emotion self-regulation's association with academic achievement.

The final section of this review discusses research that examined associations of classroom processes and early school adjustment. Within this section, associations of instructional and emotional supports and academic achievement are considered first. This is followed by a discussion of associations of emotional support and peer-related social competence. In each subsection, studies that reported direct effects are discussed first, followed by those that reported interactions.

### *Emotion Self-Regulation and Early School Adjustment*

Emotion self-regulation, a crucial developmental task of early childhood (Cole, Michel, & Teti, 1994; Shonkoff & Phillips, 2000), provides the foundation for “independent and adaptive behavioral functioning” (Calkins & Howse, 2004, p. 314) and is essential for success at school and with peers (Cole et al., 1994). Two components of emotion self-regulation, attention control and behavioral inhibition, are considered especially important for young children (Eisenberg, Smith, Sadovsky, & Spinrad, 2004b) and are frequently used indicators of preschool and early school-aged children's emotion self-regulation (Raver et al., 1999; Rothbart, Ahadi, Hershey, & Fisher, 2001). Research suggests better regulated children who can control attention and inhibit behaviors in contextually appropriate ways are more likely to adjust successfully to school's academic and social demands (Bronson, 2000; Eisenberg et al., 1997a; Howse et al., 2003b).

Emotion self-regulation is often assessed using adult reports and children's demonstrations of their abilities. The California Child Q-Sort (Fantuzzo et al., 2004), Temperament

Assessment Battery for Children (Schoen & Nagle, 1994), and Child Behavior Questionnaire (Miech, Essex, & Goldsmith, 2001) are among instruments used for parent, teacher, and observer reports of children's emotion self-regulation. Various tasks that demand attention control (Eisenberg et al., 2000; Howse et al., 2003a) or behavioral inhibition (Kochanska & Knaack, 2003; Oppen, 2003) for success have provided direct assessments of emotion self-regulation. This section of the literature review first considers emotion self-regulation's association with the academic achievement component of early school adjustment. This is followed by a discussion of emotion self-regulation's association with the peer-related social competence component of early school adjustment. Each section includes separate and/or combined influences of attention control and behavioral inhibition on early school adjustment.

#### *Emotion Self-Regulation and Academic Achievement*

*Attention control and academic achievement.* Research suggests that children who are better able to control attention frequently have better grades and higher achievement test scores (Howse et al., 2003b; Schoen & Nagle, 1994). For example, after accounting for contributions of family background and children's abilities, Coplan and colleagues (1999) found that when their mothers had reported greater attention control at the beginning of the year, children demonstrated better academic skills at the end of the school year. Martin and colleagues (1988) found kindergarten children who were rated by teachers as more able to control attention had higher first-grade achievement test scores than their more distractible classmates. Research has also reported similar associations for children often considered at risk for academic difficulties. Head Start children who, according to observers, had better attention control also had higher school readiness scores (Fantuzzo et al., 2004).



Economically disadvantaged kindergarten and second-grade children who controlled attention well during a computer task had higher achievement test scores (Howse et al., 2003a).

Nonetheless, direct associations between attention control and academic achievement are not always found. Newman and colleagues (1998) found no general association between parent-reported attention control and measures of first-grade reading achievement. However, they did report that attention control moderated the association of children's cognitive abilities and their reading achievement. While, in general, children's reading achievement was positively associated with their cognitive ability, the achievement of children with lower cognitive ability who controlled attention well was commensurate with their more cognitively able peers. Thus, it appears that, when encountering academic challenges, children's ability to control attention plays an important role in their learning. These empirical findings suggest that young children who control attention more capably are likely to have higher levels of academic achievement than their more distractible peers.

*Behavioral inhibition and academic achievement.* In a series of now classic studies, Mischel and colleagues (1975, 1970, 1972) examined associations between children's preschool abilities to delay gratification and their subsequent academic achievement. Across many variations of the delay of gratification task, preschoolers who more successfully delayed gratification were likely to become academically successful teenagers. For example, Shoda, Mischel, and Peake (1990) found that preschoolers who waited longer to receive a self-selected reward were subsequently reported by their parents to have higher Scholastic Aptitude verbal and quantitative scores. Shoda and colleagues argue that "the qualities that underlie effective self-imposed delay in preschool may be crucial ingredients" (p. 985) in

problem solving and learning. Bearing out this argument, Oppen (2003) found that young children who were better able to delay gratification were rated by their teachers as more capable at classroom tasks, more able to solve problems without adult assistance, and more likely to retain information. These empirical findings suggest that young children who inhibit behavior successfully are likely to have higher levels of academic achievement than children who have difficulty managing their own behavior.

*Combined attention control and behavioral inhibition and academic achievement.*

Children's emotion self-regulation assessed by combining adult reports of attention control and behavioral inhibition has also been positively associated with academic achievement (Brody & Flor, 1998; Normandeau & Guay, 1998). For example, Brody and Flor (1998) have reported a positive association between emotion self-regulation and academic achievement among a group of elementary school-aged African American children.

Additionally, Miech and colleagues (2001) examined the association of preschooler's parent-reported attention control and behavioral inhibition and their kindergarten teachers' reports of academic achievement. They reported that children's preschool emotion self-regulation was positively associated with kindergarten academic achievement, above and beyond contributions of children's preschool cognitive abilities and family background. These empirical findings suggest that children who successfully control attention and inhibit behavior are more likely to succeed academically than their less well regulated classmates.

*Emotion Self-Regulation and Peer-related Social Competence*

*Attention control and peer-related social competence.* Research suggests that children who are better able to control attention are frequently reported to be more socially competent (Calkins & Howse, 2004; Raver et al., 1999). For example, Raver, Blackburn, and Bancroft

(1999) examined the association of Head Start children's attention control during a computer task and their teacher-reported social competence. Raver and colleagues reported that children who maintained focus more successfully were rated as more socially competent. In a series of studies, Eisenberg and colleagues (2000, 1997b, 2003) examined associations among emotion self-regulation, negative emotionality, resiliency, and peer-related social competence. The studies began when participating children were in the primary grades. The two subsequent reports were based on data from the following two school years. Attention control was assessed by parents' reports. Peer-related social competence was assessed by teachers' reports of socially appropriate behavior. The initial report (Eisenberg et al., 1997b) described associations between attention control and peer-related social competence as a function of children's negative emotionality, which the authors defined as the tendency to experience and express negative emotions (p. 296). In this report, attention control was associated with socially appropriate behaviors only for children with high negative emotionality. In the second report that also considered negative emotionality (Eisenberg et al., 2000), attention control was associated with socially appropriate behaviors for all children, regardless of negative emotionality status. In the final report (Eisenberg et al., 2003) when negative emotionality was not considered, attention control was again associated with teachers' reports of social competence. These empirical findings suggest that children who more successfully control attention are more likely to behave in socially competent ways at school.

*Behavioral inhibition and peer-related social competence.* Research also suggests that children's behavioral inhibition is associated with their peer-related social competence. For example, Blair (2003) reported that when Head Start children's mothers reported better

behavioral inhibition, their teachers reported more socially competent behavior with classmates. In their study of Head Start children, Raver, Blackburn, and Bancroft (1999) found that children's ability to delay gratification made a significant contribution to teachers' reports of peer-related social competence, above and beyond the contributions of gender and attention control. Similarly, Smith (2001) found that young African American children who more successfully inhibited their behavior in a laboratory task were rated by their teachers as more socially competent. In the series of studies conducted by Eisenberg and colleagues (2000, 1997b, 2003) examined in the previous section, the association of children's behavioral inhibition and social competence was also examined. Behavioral inhibition was assessed using children's performance on a puzzle box task. Children were instructed to work a puzzle that was hidden inside a box, without lifting the cover to look. They were promised a reward upon completion of the puzzle and left alone to work. The time children spent working the puzzle without cheating was used to assess children's behavioral inhibition. This series of analyses indicated an association between behavioral inhibition and peer-related social competence. In the first two studies, Eisenberg and colleagues (2000, 1997b) found behavioral inhibition was associated with teachers' reports of socially appropriate behaviors only for children with high negative emotionality. In the final analysis (Eisenberg et al., 2003), when emotionality was not considered, behavioral inhibition was associated with socially appropriate behavior for all children. These empirical findings tend to indicate that, while behavioral inhibition may be especially important for children who experience and express more negative emotionality, it likely plays a role in the peer-related social competence of many children.

### *Conclusion: Emotion Self-Regulation and Early School Adjustment*

As children begin school, they encounter new cognitive and social demands (Entwisle & Alexander, 1998; Ladd, 1996). The research reviewed above suggests children's attention control and behavioral inhibition, crucial aspects of early emotion self-regulation (Calkins & Howse, 2004; Fox, Henderson, Rubin, Calkins, & Schmidt, 2001), are important to their academic and social success at school. These related aspects of emotion self-regulation (Cumberland-Li, Eisenberg, & Reiser, 2004; Eisenberg et al., 2005; Rothbart et al., 2001) appear to play an important role in academic achievement, as children must maintain focus on academic activities and eschew available and interesting off-task possibilities in order to learn. Early childhood classrooms also provide a context for developing social skills and peer relationships. Being socially competent with peers at school may depend more on children's emotion self-regulation than it did in earlier contexts where more adult support was available to help children negotiate social interactions (Ladd, 1996; NICHD Early Child Care Research Network, 2002). The research reviewed in this section provides support for the importance of emotion self-regulation, specifically attention control and behavioral inhibition, to academic and social aspects of early school adjustment. Given these findings, it is hypothesized that children's 54-month emotion self-regulation will be positively associated with their peer-related social competence and academic achievement in first grade.

### *Social Competence and Academic Achievement*

While one strand of research has suggested that emotion self-regulation plays an important role in children's academic achievement, another strand has suggested that peer-related social competence also contributes to achievement (Cobb, 1972; Entwisle, Alexander, Pallas, & Cadigan, 1987; Wentzel, 2003). Recent research has suggested that children who

are cooperative, helpful, able to take turns, and willing to share with peers have higher levels of academic achievement (Agostin & Bain, 1997; Wentzel, 2003) both concurrently (Miles & Stipek, 2006) and longitudinally (Welsh et al., 2001). Teachers' and observers' reports, frequent indicators of peer-related social competence, have often been associated with children's achievement (Coolhan, Fantuzzo, Mendez, & McDermott, 2000; Estell, Farmer, Cairns, & Cairns, 2002).

Similarly to studies of older students (Wentzel, 1993), studies involving early elementary-school-aged children have demonstrated concurrent associations between peer-related social competence and academic achievement. For example, Ladd and colleagues (1999) reported that kindergarten children's observer-rated prosocial behaviors were significantly associated with end-of-kindergarten school readiness scores, even after accounting for contributions of gender, family background, cognitive maturity, and preschool experiences,. Recently, Miles and Stipek (2006) reported that kindergarten children who were rated as more socially competent by their teachers also had higher reading achievement test scores that year. These empirical findings suggest a concurrent association between children's peer-related social competence and their academic achievement.

In addition to concurrent associations, research suggests longitudinal associations between peer-related social competence and academic achievement. Agostin and Bain (1997) have reported that kindergarten children rated more socially competent by their teachers had higher language arts and mathematics achievement test scores at the end of first grade. Similarly, Welsh and colleagues (2001) found a combined teacher-classmate assessment of first-graders' social competence was positively associated with children's language arts and mathematics grades in both second and third grade. Following students through their

elementary school years, Miles and Stipek (2006) found teachers' reports of children's social competence at kindergarten or first grade to be positively associated with third-grade reading achievement. Additionally, similar associations were found between third-grade social competence and fifth-grade achievement. Capara and colleagues (2000) have also reported longitudinal associations. Third-grade students who were rated as more likely to behave in socially competent ways had higher grades five years later. These empirical findings suggest that children's peer-related social competence has not only concurrent associations with academic achievement, but may also be predictive of future achievement as well.

*Conclusion: Peer-related Social Competence and Academic Achievement*

As children begin school, they face new social as well as academic demands. Research suggests that children who get along with their classmates are more likely to succeed academically. Socially competent children may find it easier to get help from peers, may be better able to work in both large and small group setting, and may be more likely to develop positive classroom relationships that support engagement (Ladd et al., 2004; Wentzel, 1993). Empirical findings suggest that children's peer-related social competence during the transition to school plays an important role in their initial and subsequent academic achievement. Given these findings, it is hypothesized that children's first grade peer-related social competence will be positively associated with their first grade academic achievement.

*Peer-related Social Competence as a Possible Mediator of Emotion Self-regulation's Association with Academic Achievement*

The strands of empirical literature reviewed have provided insights into child characteristics that influence early school adjustment. Research has suggested that better regulated children adjust more successfully to the academic and social demands of school. This has been demonstrated in positive associations between emotion self-regulation and school readiness (Coplan et al., 1999; Fantuzzo et al., 2004), achievement test scores (Howse et al., 2003a; Martin et al., 1988; Shoda et al., 1990), and teachers' reports of academic achievement (Miech et al., 2001; Oppen, 2003) and social competence (Eisenberg et al., 2003; Raver et al., 1999). Other research has indicated that more socially competent children are better prepared to meet school's academic challenges. This has been demonstrated in positive associations between peer-related social competence and achievement tests scores (Agostin & Bain, 1997; Miles & Stipek, 2006) and grades (Capara et al., 2000; Welsh et al., 2001). The convergence of these strands of literature raises two possibilities. On one hand, it is possible that emotion self-regulation's association with academic achievement is mediated by peer-related social competence. On the other hand, emotion self-regulation may underlie both peer-related social competence and academic achievement, but there may be no association between them. The first of these possibilities is consistent with Ladd and colleagues' (Ladd et al., 2004; Ladd & Kochenderfer, 1996) ideas concerning the importance of early peer relationships to children's academic achievement. From this perspective, children garner support for academic achievement from their relationships with peers. For example, children may participate more fully in classroom activities when they enjoy the positive regard of their peers. In the context of positive peer relationships, children may turn to classmates for help, easily understandable explanations, and assurance. From a different



perspective, however, Hawley (1999) might argue that early school-aged children who successfully control environmental resources are more prosocial in their behaviors and more able to access important academic resources. In this case, children's social competence with peers and their academic achievement are not causally associated; rather both are products of abilities to control environmental resources. These two possibilities underlie this study's child-level research question: Is it possible that at least part of emotion self-regulation's influence on academic achievement is mediated by peer-related social competence?

To date, peer-related social competence has not been investigated as a possible mediator of emotion self-regulation's influence on academic achievement. Research has demonstrated the importance of emotion self-regulation to social and academic aspects of early school adjustment (Brody & Flor, 1998; Coplan et al., 1999; Eisenberg et al., 2000) and of peer-related social competence to academic achievement (Estell et al., 2002; Wentzel, 2003). However, to understand more fully the role of emotion self-regulation during the transition to school, it is crucial to examine peer-related social competence as a possible mediator of the association of emotion self-regulation and academic achievement. Such an examination has the potential to clarify the nature of emotion self-regulation's role during the transition to school.

Hartup and Sancilio (1986) have suggested that, in the context of positive peer relationships, children acquire new skills and cognitive abilities. Ladd and Kochendorfer (1996) have hypothesized that positive peer relationships in the classroom provide emotional support and congenial contexts for learning. Thus, there are theoretical reasons to propose that peer-related social competence may be a mechanism through which emotion self-regulation influences academic achievement. If this is the case, an analysis of mediation

should show that peer-related social competence mediates the association of 54-month emotion self-regulation and first grade academic achievement.

However, it is also possible that the statistically significant associations between peer-related social competence and academic achievement reported in the literature are spurious, resulting from their common origins in emotion self-regulation. Hawley (1999) has contended that children differ in their abilities to access environmental resources. If so, then some children should be better able to avail themselves of classrooms' social and academic resources. Social resources include positive peer relationships, access to peer social groups, along with peer help and support. Academic resources include positive attention from teachers, acquisition of equipment and materials, and teacher-granted privileges. Thus, 54-month emotion self-regulation may only be directly associated with first grade peer-related social competence and academic achievement. If this is the case, an analysis of mediation should show that peer-related social competence does not mediate that association of 54-month emotion self-regulation and first grade academic achievement.

### *Classroom Supports and Early School Adjustment*

Children's characteristics are not the only influence on their early school adjustment. Ecologically oriented systems theories argue that the nature of children's ongoing classroom experiences should also affect their early school adjustment (Bronfenbrenner & Morris, 1998; Rimm-Kaufman & Pianta, 2000). In primary classrooms, children have frequent experiences with various instructional and emotional supports provided by their teachers (Hamre & Pianta, 2005; NICHD Early Child Care Research Network, 2002). Instructional support can be seen in the ways teachers design and implement daily academic lessons. Two broad categories have often been used to describe instructional support. Classrooms where

teachers provide high levels of explicit, direct instruction have been described as didactic, or academically-focused (Marcon, 1999; Stipek et al., 1995). Classrooms where teachers offer choices, use child-managed learning centers, and encourage children to take responsibility for their own learning have been described as child-centered, or developmentally appropriate (Bredekamp & Copple, 1997; Schweinhart & Weikart, 1998). Additionally, global aspects of instructional support, including frequency of instruction, instructional conversation, and evaluative feedback, have been used to describe instructional support (Hamre & Pianta, 2005; NICHD Early Child Care Research Network, 2002). Emotional support can be seen in teachers' sensitivity, responsiveness, effective classroom management, and the overall classroom emotional climate they create (NICHD Early Child Care Research Network, 2002). Emotional support may also be seen in positive teacher-child interactions and closer teacher-child relationships (Burchinal et al., 2002; Pianta, Nimetz, & Bennett, 1997). Research has suggested that classroom instructional and emotional supports facilitate early school adjustment, for at least some children (Hamre & Pianta, 2005; Silver et al., 2005).

Observers and teachers have provided information about classroom instructional and emotional supports. Instructional support is frequently assessed using observers' ratings of teachers' behaviors related to children's learning (Pianta et al., 2002; Stipek et al., 1998). Teachers' reports of their own instructional practices have also been used (Marcon, 1999; van den Oord & Van Rossem, 2002). For the purposes of this literature review, instructional support will be examined using three indexes: (1) measures of explicit, didactic instruction; (2) measures of child-centered, developmentally appropriate instruction; and (3) global, qualitative ratings of teachers' instruction-related behaviors. Emotional support is frequently assessed using teachers' reports of their relationships with students (Ladd et al., 1999; Ladd

& Burgess, 2001). Observers' reports of classroom emotional climate, classroom management, and teachers' behaviors and dispositions related to children have also been used to assess emotional support (Hamre & Pianta, 2005; NICHD Early Child Care Research Network, 2002). For this literature review, emotional support will be examined using indexes of positive teacher-child interactions and relationships and global, qualitative ratings of emotional support. This literature review examines the influences of classroom instructional and emotional supports on two aspects of early school adjustment: academic achievement and peer-related social competence.

In the following sections, associations between teacher-provided classroom supports and academic and social aspects of children's early school adjustment will be discussed. Initially, the association of instructional support and academic achievement will be considered. This will be followed by a discussion of the association of emotional support and achievement. Finally, the association of emotional support and children's social competence will be considered.

### *Classroom Supports and Academic Achievement*

*Instructional support and academic achievement.* Research examining direct associations between teachers' instructional practices and children's academic achievement has not provided consistent support for the importance of either didactic or child-centered instruction (Rutter & Maughm, 2002). For example, Stipek and colleagues (1995) reported that preschoolers and kindergarteners enrolled in didactic, academically focused classrooms had higher literacy achievement than children in child-centered classrooms, but there was no significant difference in their mathematics achievement. Stipek and colleagues (1998) subsequently examined differences in literacy and mathematics achievement of children who were enrolled in didactic or child-centered classrooms for two consecutive years. Two years in an academically-focused classroom was associated with higher literacy achievement than two years in a child-centered classroom. There were no significant differences between mathematics achievements of these two groups of children. Unlike Stipek and colleagues, Marcon (1999) reported that children in the Washington, D.C. public schools preschool classes had higher literacy and mathematics achievement when they were enrolled in classrooms that their teachers described as child-centered, developmentally appropriate rather than in didactic classrooms.

Additionally, both Stipek and colleagues (1998) and Marcon (1999) examined the benefits of combining didactic and child-centered instruction. Stipek and colleagues (1998) included a group of children who were enrolled in a child-centered classroom for one year, followed by a year in a didactic classroom. These children had literacy achievement levels statistically similar to children who were consistently enrolled in either didactic or child-centered classes. The mathematics achievement of children who had two different classroom experiences was

significantly lower than that of children in child-centered classes for two years, but was similar to that of children consistently enrolled in didactic classrooms. In the study of the Washington, D. C. public preschools, Marcon (1999) found that, when teachers reported using a combination of didactic and child-centered practices, their student's literacy and mathematics achievement was lowest among the three groups: didactic, child-centered, and combination. These two reports tend to indicate that combining didactic and child-centered instruction does not offer the benefits of both methods. Thus, it appears that research examining the direct influence of teachers' classroom instructional practices on children's academic achievement has not provided a "strong case for classroom effects" (Hamre & Pianta, 2005, p. 950) for didactic or child-centered instruction.

More recently, however, research has begun to examine complex associations between instructional support and children's achievement by including interactions between instructional support and characteristics of children. For example, Hamre and Pianta (2005) reported that, in general, kindergarten children did not have higher levels of achievement when teachers provided more instructional support, including explicit instruction and evaluative feedback. However, they also reported that children whose mothers had high school educations or less had achievement commensurate with peers when their teachers provided at least moderate levels of instructional support. Similarly, Connor and colleagues (Connor et al., in press) have found that, when children begin school with fewer literacy skills, more frequent explicit, literacy instruction is associated with substantial skill development. On the other hand, children who began school with stronger skills saw greater gains in more child-centered classrooms. These empirical findings tend to indicate that, as

with older students (Eccles, Lord, & Buchanan, 1996), the fit between classroom supports and child characteristics may have profound effects on younger students' achievement.

*Emotional support and academic achievement.* Research has not provided strong support for the importance of teacher-provided emotional support, including close teacher-child relationships and positive classroom interactions, to children's academic achievement. Pianta and colleagues (2002) reported that when observers rated teacher-child interactions more positively, children's teacher-reported mathematics and reading achievement scores were higher. However, these positive associations accounted for only 3.2 % of reading achievement and 6.7% of mathematics achievement when contributions of family income and maternal education were controlled. Similarly, Birch and Ladd (1997) reported that a close relationship with kindergarten teachers accounted for 3.0% of children's language achievement test scores. After accounting for the influences of children's gender, ethnicity, cognitive abilities, and behaviors, Hamre and Pianta (2001) found that a close relationship with kindergarten teachers explained 3.0% of language arts grades, mathematics grades, and achievement test scores in first through fourth grade. Finally, Pianta and Stuhlman (2004) found close relationships with preschool and kindergarten teachers were not associated with first-grade vocabulary achievement test scores or mock report card grades. They also reported that a close teacher-child relationship in first grade was not associated with concurrent vocabulary achievement. While some empirical findings have indicated a statistically significant direct association between emotional support and achievement, these associations have been small. Other studies have reported no significant associations between teacher-provided emotional supports and their students' achievement. Thus, these

findings do not provide compelling evidence for a direct association between emotional support and children's academic achievement.

More recently, by including interactions between emotional support and child characteristics, ecologically oriented research has found that the academic achievement of some children is reliant on emotional support from teachers. In a study examining children's achievement during preschool, kindergarten, and second grade, Burchinal and colleagues (2002) found that close teacher-child relationships, especially during the preschool years, were associated with gains in vocabulary. Additionally, they reported that the association was stronger for children of color than for white children. In the same study, Burchinal and colleagues found that, although gains in reading achievement were not generally associated with close teacher-child relationships, the reading achievement of children whose parents were less likely to use progressive parenting practices was higher when they had a close teacher-child relationship. Thus, younger children, minority children, and children whose parents use less progressive parenting practices may benefit more from a close relationship with their teachers. Hamre and Pianta (2005) have also reported that teacher-provided emotional support (less intrusiveness, detachment, over-control, negative emotional climate; more sensitivity and positive emotional climate; and better classroom management) was not generally associated with children's achievement. However, for children with at least two of four functional risk factors (low levels of social skills, academic competence, and attention focus; and high levels of externalizing behavior problems), emotional support was crucial for academic achievement. When teachers provided high levels of emotional support, these at-risk children had achievement test scores equivalent to their peers. These empirical findings



tend to indicate that teacher-provided emotional supports play an important role in some children's early academic achievement.

### *Classroom Supports and Peer-Related Social Competence*

*Emotional support and peer-related social competence.* Research has frequently found direct and interactive associations between teacher-provided emotional supports and children's peer-related social competence. For example, Peisner-Feinberg and colleagues (2001) reported that children who had close relationships with their preschool teachers were rated more socially competent by their kindergarten and second-grade teachers. Similarly, Pianta, Steinberg, and Rollins (1995) found that children who had close relationships with their kindergarten teachers were rated more socially competent by their first-grade teachers. Additionally, Pianta and colleagues used children's social competence in kindergarten to predict their first-grade social competence. When children had close relationships with their kindergarten teachers, their first-grade social competence was higher than predicted, implying that teacher-provided emotional support may enhance children's future social competence. Finally, Silver and colleagues (2005) have reported that close teacher-child relationships may alter the generally increasing developmental trajectory of externalizing behaviors for children during the primary grades. When children with high levels of externalizing behaviors had close relationships with their kindergarten teachers, their mothers reported increasingly and significantly lower levels of these behaviors in first and third grades. Additionally, when kindergarten teacher-child relationships were close, children who began school with average levels of externalizing behaviors did not follow the general trend of increasing behaviors. Thus, it appears that teacher-provided emotional support may facilitate social competence and impede negative behaviors. The empirical findings tend to

suggest that, when teachers provide emotional support for children, children are more likely to behave more socially competent ways.

*Conclusion: Classroom Supports and Early School Adjustment*

Research suggests few direct associations between classroom supports and children's academic achievement. Neither didactic nor child-centered instruction has proved consistently effective in helping children acquire academic skills as measured by standardized assessments. Teacher-provided emotional support has generally had little influence on children's academic achievement. However, when characteristics of children are considered, associations between instructional and emotional supports and academic achievement are often stronger and more consistent. When children begin school with fewer academic skills, their academic achievement may depend on higher levels of instructional support. Teacher-provided emotional support may be especially important for children whose earlier experiences and classroom behaviors impede their learning.

Research examining associations of emotional support and children's peer-related social competence has provided more consistent evidence. Children who enjoy positive relationships with their teachers are likely to be more socially competent with peers as well. Thus, it appears that, at least for some children, instructional and emotional supports provided by teachers during the transition to school may be essential to academic and social aspects of early school adjustment. Given these findings, it is hypothesized that classroom instructional support will not affect the academic achievement of less well regulated children. However, it is hypothesized that high levels of classroom emotional support will positively affect the peer-related social competence and academic achievement of less well regulated children. Thus, while instructional support is not hypothesized to moderate the association of

54-month emotion self-regulation and first-grade academic achievement, emotional support is expected to moderate emotion self-regulation's associations with both first grade peer-related social competence and academic achievement.

### *Conclusion*

Two distinct bodies of research concerning influences on children's early school adjustment have been discussed in this literature review. The first includes research that has examined influences of child characteristics on early school adjustment; the second includes research that has examined similar influences of classroom processes. Research concerning the influences of two child characteristics, emotion self-regulation and peer-related social competence, on early school adjustment was reviewed first. This included research concerning emotion self-regulation's association with academic and social aspects of early school adjustment and other research concerning associations of peer-related social competence and academic achievement. Following the discussion of associations of child characteristics and early school adjustment, research concerning influences of two classroom processes, instructional support and emotional support were reviewed.

In general, the research reviewed has suggested that emotion self-regulation and peer-related social competence are positively associated with early school adjustment. Specifically, when children more successfully control attention and inhibit behavior, they are more likely to succeed academically (Howse et al., 2003b; Oppen, 2003) and socially (Eisenberg et al., 1997b; Raver et al., 1999). Additionally, when children use more socially appropriate behaviors, they are more likely to succeed academically (Miles & Stipek, 2006; Welsh et al., 2001). Thus, it appears that, during the transition to school, children's emotion

self-regulation and peer-related social competence may make important contributions to their school adjustment.

While research examining direct influences of teacher-provided instructional and emotional supports proved inconclusive (Birch & Ladd, 1997; Marcon, 1999; Pianta & Stuhlman, 2004), ecologically-oriented research has begun to demonstrate the importance of these supports for specific groups of children. For example, instructional support may be especially important for children who begin school with fewer academic skills (Connor et al., in press; Hamre & Pianta, 2005). Additionally, emotional supports may be crucial for children whose prior experiences have not prepared them for the academic and social demands of the classroom (Burchinal et al., 2002; Hamre & Pianta, 2005).

From the research reviewed, it appears that characteristics of children and their classrooms play important roles in children's adjustment during the transition to school. Children's abilities to regulate their emotions and to manage their behaviors in contextually appropriate ways may be as important to their success at school as cognitive abilities (Newman et al., 1998) and family backgrounds (Brody & Flor, 1998; Raver et al., 1999). While many children begin school ready to learn, others may be more challenged by school's academic and social demands (Ladd, 1996; Stipek & Ryan, 1997). These children may be more likely to succeed when their teachers provide more instructional and emotional supports (Burchinal et al., 2002; Hamre & Pianta, 2005). Because successful early school adjustment has been consistently associated with subsequent academic and social success at school (Alexander & Entwisle, 1988; Hamre & Pianta, 2001), it is crucial to understand child and classroom characteristics associated with successful adjustment during the transition to school.

### *Research Questions and Hypotheses*

This dissertation study asked four principal research questions. The first question was, “Does children’s first-grade peer-related social competence mediate preschool emotion self-regulation’s association with first-grade academic achievement?” Because there were neither theoretical nor empirical reasons to favor mediation or a lack thereof, there was no hypothesis for this question. The second question was, “Does classroom instructional support moderated preschool emotion self-regulation’s association with first-grade academic achievement?” It was hypothesized that classroom instructional support would not moderated preschool emotion self-regulation’s association with first-grade academic achievement. The next question was, “Does classroom emotional support moderate preschool emotion self-regulation’s association with first-grade peer-related social competence?” It was hypothesized that classroom emotional support would moderate preschool emotion self-regulation’s association with first-grade peer-related social competence. The final question was, “Does classroom emotional support moderate preschool emotion self-regulation’s association with first-grade academic achievement?” It was hypothesized that classroom emotional support would moderate preschool emotion self-regulation’s association with first-grade academic achievement.

## CHAPTER III

### METHOD

The dissertation study involved a secondary analysis of the NICHD SECC Phase I and Phase II data. NICHD SECC is a multi-phase, prospective, longitudinal study which follows a sample of children born between January and November 1991. Beginning when the children were one month old, Phase I data collection encompassed their first three years. Phase II data collection began when the children were 42 months old and ended in the spring of their second year in school. The study participants were recruited at 10 sites around the country and represent rural, suburban, and urban children. While not a nationally representative sample, ethnic-minority, single-parent, and low-education families are represented.

The NICHD SECC data offer many advantages to the proposed study, including its large, diverse sample. With its focus on the relation of children's experiences in various contexts and their cognitive, social, and emotional development, NICHD SECC provides a rich source of data for the proposed study. Children's experiences, environments, and development were assessed through observations, direct measurements, and reports from parents and teachers. The availability of multiple measures from multiple sources is important to the proposed study which examined relations among latent constructs. Because no single measure can capture a construct completely, a reasonable confluence of multiple indicators is needed to assess a latent construct more adequately (Thompson, 2004). Additionally, the NICHD

SECC prospective, longitudinal design supports the examination of relations across time and of contextual influences on developmental trajectories.

### *Participants*

NICHD SECC's Phase I participating families were recruited in hospitals shortly after the children were born, met initial eligibility criteria, and participated in home visits when the children were one month old. Of the 1364 participating families, 25% were ethnic-minority families, 18.8% of families received public assistance, 10.4% of mothers had not graduated from high school, and 14% of mothers were single. Nonetheless, mean household income was above the national average, as was mothers' mean education level. Phase II began with 1233 continuing families (NICHD Early Child Care Research Network, 2001). When the children were 54 months, there were 1081 participating families. At that time, 21% were ethnic-minority families; 15% of the mothers were single. Mothers averaged 14.4 years of education; family incomes averaged 3.6 times the poverty threshold (NICHD Early Child Care Research Network, 2003a).

### *Dissertation Study Participants*

Participants for this dissertation study were drawn from the Phase II data. Because the study's foci were the relations among children's emotion self-regulation, peer-related social competence, and first grade academic achievement, only data from children enrolled in first-grade classrooms during their second years in school were included in the analysis. A small proportion of NICHD SECC children were in classrooms of fewer than ten children. A few first grades were half-day programs. Data from these children were excluded to ensure that participants' experiences represent typical first-grade experiences. In most instances, there

was only one NICHD SECC participating child in a classroom. For classrooms with two or more participating children, one child was randomly selected as a study participant.

The dissertation sample consisted of 740 children (372 boys, 368 girls) who met the selection criteria. During the one-month home visit mothers provided information on children's gender and ethnicity. Participants were primarily white, not Hispanic (79.9%). However, children of color were also represented and were described by their mothers as African American (10.1%), Hispanic (5.5%), Asian or Pacific Islander (1.2%), American Indian, Eskimo, or Aleut (0.3%), or other (3.0%). Mothers also reported their own education levels, a frequent indicator of family socioeconomic status (Alexander, Entwisle, & Dauber, 1993; Burchinal et al., 2002). Mothers of dissertation study participants averaged 14.46 years of education; 26.5% had high school/GED educations or less, 33.9% had some education beyond high school, but were not college graduates, and 39.9% held Bachelor's degrees or higher. In the spring of the children's first-grade years, the dissertation sample's mean household income (\$68,022.23) was above the national average (national average, 1997: \$44,568.00; national average, 1998: \$46,737.00) (United States Census Bureau, 2006). When the children were six-, 15-, 24-, 36-, and 54-months old, mothers reported annual family income. Income-to-needs ratios were calculated by NICHD based on annual income, household size, and number of minor children in the household. The mean of these income-to-needs ratios (mean = 3.62, sd = 2.59, range: 0.22-23.79) was used as a measure of economic status (for precedent see NICHD Early Child Care Research Network, 2003b).



## *Measures*

### *Fifty-four Month Emotion Self-regulation*

*Attention control.* Two measures of children's attention control were used, a computerized Continuous Performance Task (CPT) and parents' reports of attention focus. Attention control is considered an important strategy for young children's emotion self-regulation (Thompson, 1994). CPT has often been used to assess children's attention control (Brocki & Bohlin, 2004; Espy et al., 2004; Holmes et al., 2002; Lindsay, Tomazic, Levine, & Accardo, 2001; Schwartz, 2001). In the NICHD SECC version, children saw computer-generated pictures, for example a fish or a flower, on a 2-inch square screen. They were instructed to press the response button quickly, and only once, each time they saw the target stimulus. Prior to the experimental session, children practiced until they achieved four correct responses, including at least two consecutive correct responses. During the experimental session, children received 10 blocks of 22 stimuli. The target stimulus was presented randomly, twice within each block. For the proposed research, the proportion of correct responses will be used to assess children's attention control.

Mothers responded to a modified version of the Children's Behavior Questionnaire (CBQ) (Rothbart et al., 2001). The CBQ was designed as a parent report to provide "a highly differentiated assessment of temperament in young children" (p. 1394). Rothbart and Bates (1998) have distinguished between reactive and effortful aspects of temperament. They considered attention control and behavioral inhibition to be effortful. Recently, Eisenberg and Spinrad (2004) have agreed, calling these aspects voluntary, that is, not automatic or reflexive, but "controlled by the individual" (p. 337). The alternative version of the CBQ used for the NICHD SECC contained 80 items in eight scales. Scale items describe possible

reactions children might have in different circumstances. Attention focus (CBQAF) was the mean of eight items, four of which are reversed prior to analysis. An example of these items is “My child shows strong concentration when drawing or coloring.” Respondents used a seven-point Likert-type scale (extremely untrue = 1; extremely true = 7). Responses of “not applicable” were set to missing. Internal reliability (Cronbach’s alpha) for these data (n = 684) was 0.76.

No validity information for measures of attention control was provided by NICHD SECC for these data.

*Behavioral inhibition.* Two measures of children’s behavioral inhibition were used, a Delay of Gratification (DOG) task and parents’ reports of behavioral inhibition. Emotion self-regulation demands the inhibition of inappropriate behaviors and the deployment of appropriate ones (Bronson, 2000). Delay of gratification is a classic, frequently used, direct assessment of children’s behavioral inhibition (Kochanska & Knaack, 2003; Shoda et al., 1990). In the NICHD SECC version, children were asked to wait alone while the experimenter was out of the room. Two treats, a smaller, less desired amount and a larger, more desired amount were left within the child’s reach. Children were told that if they could not wait, they could ring a bell and the experimenter would return. The experimenter explained that, under these conditions, the child would receive the smaller amount. If children began to eat the treat or if they rang the bell, the experimenter returned and gave the smaller amount. Otherwise, the experimenter waited seven minutes before returning. The length of time children waited was used to measure behavioral inhibition.

On the alternative CBQ inhibitory control scale, mothers responded to ten items designed to assess children’s behavioral inhibition. Behavioral inhibition (CBQBI) was the mean of

these items, three of which were reversed prior to analysis. An example of the inhibitory control items is “My child is good at following directions.” Respondents used the seven-point Likert-type scale (extremely untrue = 1; extremely true = 7). Responses of “not applicable” were set to missing. Internal reliability (Cronbach’s alpha) for these data was 0.75.

No validity information for measures of behavioral inhibition is provided by NICHD SECC for these data

#### *Peer-related Social Competence during Spring of First Grade*

*First-grade unstructured peer interaction observations.* Trained observers used the First Grade Unstructured Peer Interaction Observation instrument during children’s recess or free play time. Their reports may include interactions with children other than classmates. The observations provide a relatively unbiased assessment of children’s peer-related social competence during child-selected activities. Observers recorded frequencies of children’s behaviors in 30-second-watch-30-second-record cycles. At the completion of frequency data collection, observers recorded global, qualitative descriptions of children’s peer interactions on a seven-point Likert-type scale with higher scores indicating higher levels of assessed characteristics. Four frequency scores, small group activity, large group activity, shared positive affect with peers, and positive engagement will be used. A new variable, peer activity, was created using the sum of small group activity and large group activity. Frequency scores quantify the portion of recess during which the child was involved with peers in mutually enjoyable, teacher-approved activities. Three qualitative scores, prosocial orientation, positive mood, and peer interaction in a positive situation were also used. These scores describe global characteristics of the child’s social orientation and demeanor during

recess. NICHD SECC Child Care Data Reports (CCDR) provide two types of live interrater reliability analyses for these data, Pearson product moment correlations and estimates based on repeated measures ANOVA (Winer, 1971). Live interrater reliabilities were computed from two observers' concurrent observations of 48 children. Based on the complete sample, Pearson correlations range from 0.93 to 0.97 and from 0.89 to 0.92, for frequency and qualitative scores respectively. ANOVA-based estimates range from 0.95 to 0.99 and from 0.94 to 0.99, for frequency and qualitative scores respectively. Gold-standard videotape test reliabilities based on 226 to 254 pairs are also reported. Pearson correlations range from 0.42 to 0.73 and 0.52 to 0.76, for frequency and qualitative scores respectively. ANOVA-based estimates range from 0.59 to 0.76 and from 0.68 to 0.86, for frequency and qualitative scores respectively.

*Teacher's reports.* Early in the spring semester, teachers completed a questionnaire designed to assess children's ability to interact with peers and form classroom friendships. Children's peer acceptance was assessed by the first four questionnaire items. The first item asked if there were children who like to work or play with the child. The second asked if there were children who do not like to work or play with the child. Respondents used a five-point Likert-type scale (none = 1; nearly all = 5). Responses to the second item were reversed prior to analysis. The third and fourth items asked if the child was well liked by same-sex peers and by opposite-sex peers. Respondents used a five-point Likert-type scale (never true = 1; almost always true = 5). Peer acceptance was the sum of these four items. Internal reliability (Cronbach's alpha) for these data was 0.89.

Teachers also reported children's social competence with peers using the Social Skills Rating System (SSRS) (Gresham & Elliott, 1990). Appropriate for elementary school

students, SSRS provides a measure of students' social skills, problem behaviors, and academic competence. The teacher version has often been used to assess aspects of children's social competence at school (Agostin & Bain, 1997; Beebe-Frankenberger, Bocian, MacMillan, & Gresham, 2004; Bramlett, Scott, & Rowell, 2000). The social skills section includes 30 items documenting teachers' perceptions of frequencies of specific classroom behaviors. Each item asks teachers to describe, on a three-point scale (never = 0; sometimes = 1; very often = 2), how often children use a specific behavior. Ten items specifically address children's social competence with peers, for example, "This child makes friends easily." Social competence with peers was the sum of these items. Internal reliability (Cronbach's alpha) for these data was 0.85.

No validity information for measures of classroom teachers' reports of social competence during the spring of first grade is provided by NICHD SECC for these data.

#### *First-grade Academic Achievement*

*Child-performance academic achievement.* The Woodcock–Johnson Psycho–Educational Battery Revised (WJ-R) is a wide-range, comprehensive battery of individually administered tests used to measure cognitive abilities and academic achievement. Academic achievement subscales were administered consecutively by trained visit coordinators during one section of the first-grade laboratory visit. WJ-R is frequently used to assess children's academic achievement (Brody & Flor, 1998; Newman et al., 1998; Stipek et al., 1998). First-grade academic achievement was assessed by three subscales, letter-word identification, word attack skills, and applied problems. Internal reliabilities (KR20) for these data were 0.91 (letter-word identification and applied problems) and 0.77 (applied problems). Children's standard scores were used in the dissertation study.

*Teachers' reports of children's academic achievement.* Teachers reported children's academic achievement using an adapted form of the Academic Skills measure from the Early Childhood Longitudinal Study (ECLS) and a Mock Report Card. The ECLS Academic Skills measure contains two subscales, Language and Literacy and Mathematical Thinking. Respondents used a five-point Likert-type scale (not yet = 1; proficient = 5). Language and Literacy was the mean of 15 items. An example of these items is "This child understands and interprets a story." Mathematical Thinking was the mean of ten items. An example of these items is "This child makes reasonable estimates of quantity." Internal reliabilities (Cronbach's alphas) for these data were 0.94 and 0.90 for Language and Literacy and Mathematical Thinking respectively.

The Mock Report Card, a surrogate for grades which have often been used to assess academic achievement (Capara et al., 2000; Normandeau & Guay, 1998; Vandell & Hembree, 1994), was selected to provide uniform information on children's achievement. Teachers rated achievement in reading, oral language, written language, mathematics, social studies, and science on a five-point Likert-type scale (below grade = 1; excellent = 5). The mean of reading, written language, and mathematics (grade average) was used in this study. Complete scale internal reliability (Cronbach's alpha) for these data was 0.90.

No validity information for measures of teachers' reports of academic achievement is provided by NICHD SECC for these data.

#### *Fifty-four-month Control Variables for Academic Achievement*

To provide a more robust measure of first-grade academic achievement, children's first-grade scores were adjusted using prior scores. Fifty-four-month WJ-R standard scores were available for letter-word identification and applied problems, but not for word attack skills.

Fifty-four-month picture vocabulary scores were included instead. Internal reliabilities (KR20) for these data are 0.74 (picture vocabulary), 0.86 (letter-word identification), and 0.86 (applied problems).

### *First-grade Classroom Supports*

The Classroom Observation System (COS-1) was designed for the NICHD SECC to describe children's first-grade experiences. During the spring, trained observers visited each child's classroom at the beginning of one instructional day. Each three-hour observation period focused on one child. During COS-1 observation, there were two 44-minute behavioral observation cycles when teacher and child behaviors are recorded. At the conclusion of the two cycles, observers record global, qualitative ratings of classroom quality, teacher, and child behaviors on a seven-point Likert-type scale (uncharacteristic = 1; extremely characteristic = 7). Global, qualitative ratings of the classroom included classroom over-control, positive emotional climate, negative emotional climate, effective classroom management, literacy instruction, evaluative feedback, instructional conversation, and child responsibility. Global, qualitative ratings of teachers included teacher sensitivity, teacher intrusiveness, and teacher detachment. Live interrater reliabilities were computed from two concurrent observations of 46 children. Based on the complete sample, Pearson correlations range from 0.55 to 0.84. ANOVA-based estimates range from 0.69 to 0.93. Gold-standard videotape test reliabilities computed from 179 to 181 pairs are also reported. Pearson correlations range from 0.30 to 0.77. ANOVA-based estimates range from 0.45 to 0.87. Additionally, it should be noted that, while most classrooms were observed only once, classrooms, attended by more than one participating child, were observed more than once. The average correlation for global, qualitative ratings for all first-grade classrooms ( $r = 0.79$ ,

SD = 0.03) indicates these are relatively stable classroom characteristics (NICHD Early Child Care Research Network, 2004a).

A partial analysis of external validity for the COS-1 has been reported by the NICHD Early Child Care Research Network (2003a). This report is based on a comparison of the top and bottom terciles of teacher-reported characteristics of children, classrooms, and schools. Teachers who reported more difficulties preparing children for school success, fewer children at or above grade level, and more problems working with families were observed provide less emotional and instructional support for their students. NICHD Early Child Care Research Network (2002) has also reported that instructional support is not associated with teachers' years of experience or their level education. Emotional support was found to be positively associated with level of teachers' education, but not with years of experience. Additionally, Hamre and Pianta (2005) found that children of less well educated mothers were only slightly more likely to be enrolled in classrooms providing very low levels of instructional and emotional supports than were children of better educated mothers. A full validity analysis for the COS-1 data, available from NICHD ECCRN, has been requested.

### *Preparation of Data for Analysis*

#### *Construction of an analysis data set*

An analysis data set was constructed from the Phase I and Phase II NICHD SECC data sets. Demographic information was available primarily in Phase I data. Phase II data contained 54-month and first-grade child and classroom variables, and 54-month income-to-needs ratios. Participants were selected according to study criteria; all other data were excluded prior to analyses.



### *Missing data*

The CBQAF scale item-level data met the three conditions described by NICHD SECC for imputation of internally missing scale scores. First, there were no more than 20% of the items for the scale missing (i.e. no case was missing more than 1 of 8 items). Second, for these data, the standardized Cronbach's alpha for the scale exceeded 0.75. Finally, scale items were unit weighted, with negatively worded items reflected. Twenty-one internally missing CBQAF scale item scores were imputed by proportional weighting as recommended by NICHD SECC. The imputed score ( $IS$ ) was calculated from the obtained score ( $OS$ ), the number of items in the scale ( $n$ ), and the number of items for which there were responses ( $m$ ), such that  $IS = \left(\frac{n}{m}\right)OS$ .

Subsequently, data were examined for patterns in missing data (Mplus 4.0) using covariance coverage proportion as a measure of missingness. Only four variables (CPT, DOG, CBQAF, CBQBI) had covariance coverage values below 0.90. Of these, only DOG, with mean covariance coverage = 0.85, had no values above 0.90. Of the 740 participants, 649 (87.7%) had DOG scores. The minimum coverage proportion default for model estimation is 0.10 (Muthen & Muthen, 2006, p. 348). The pattern of missingness appeared to be arbitrary and was assumed to be missing at random (MAR) (Schafer & Graham, 2002)

Missing data among model variables would have reduced the analysis sample size. Because there was a moderate amount of missing data, multiple imputation was conducted (Schafer & Graham, 2002; Widaman, 2006). Multiple imputation in SAS version 9.1 was used to generate plausible values for missing data (Rubin, 1987; Yang). Recent analyses of large data sets have used multiple imputation to estimate plausible values (Downey, von Hippel, & Broh, 2004; Kainz, 2005). Multiple imputation produced five data sets with

complete data for all cases. Model estimation in Mplus 4.0 was conducted using the five imputed data sets. The estimation of plausible values did not account for sample clustering (site). However, site was maintained in the imputed data sets and was included in most models. Parameter estimates and fit indexes are average values across model estimates for the five imputed, complete data sets.

### *Recoded Demographic Variables*

Three demographic variables, children's ethnicity, mothers' education, and income-to-needs ratio means were recoded. Mothers' reports of children's ethnicity were recoded to a dichotomous variable, child ethnicity. Children reported as white, not Hispanic were included in one ethnicity group. All children of color were included in the second group. Mothers' reports of their own educations were recoded into a three- category variable, education level. Low-education level included all women with high school education, GED certificates or less. Middle-education level included all women with some education beyond high school, but who were not college graduates. High-education level included all women with Bachelor's degrees or higher. The mean of six-, 15-, 24-, 36-, and 54-month income-to-needs ratios was recoded into a dichotomous variable, family financial status. Along with gender, recoded demographic variables were used as control variables in analyses.

### *Measure Development*

This dissertation study used structural equation modeling to examine its research questions. Structural equation modeling is a powerful, multivariate analysis method used to examine associations among latent variables. In structural equation modeling, latent variables are theoretical constructs specified by multiple, conceptually-related, measured indicators (Gall, Gall, & Borg, 2003, pp. 355 - 357). This study included child-level and

classroom-level latent variables. Prior to examining the research questions, confirmatory factor analysis (CFA) was used to specify child-level latent variables. Additionally, exploratory factor analysis was used to specify classroom-level latent variables. Specification of these latent variables is described below. Specification of child-level variables is described first. Subsequently, specification of classroom-level variables is described.

#### *Confirmatory Factor Analyses of Child-Level Latent Variables*

CFA of child-level latent variables were conducted prior to examining structural equation models. CFA tests the fit of latent variable models to data (Thompson, 2004, p. 115). Thompson reminds the reader that “delineating how measured variables reflect ... latent variables” (p. 110) to be used in a structural equation model (SEM) is an important precursor to SEM analysis. Additionally, Thompson has recommended examining the fit of single-latent-variable models to provide support for subsequent multiple latent variable models, because, as he says, “It makes little sense to relate constructs within an SEM model if the [latent variables] specified as part of the model are not worthy of further attention” (p. 118).

For this dissertation study, CFA (Mplus 4.0) were conducted using the five imputed data sets. Many latent variable indicators were not normally distributed. A maximum likelihood estimator (MLR) that provided standard errors and  $\chi^2$  fit indexes that are robust to non-normality and non-independence (Muthen & Muthen, 2006, p. 426) was used. Additionally, it should be noted that data were collected at ten sites. For this reason, CFA included the site of data collection as a cluster variable. Using a cluster variable accounted for non-independence of observations resulting from cluster sampling (Muthen & Muthen, 2006, p. 205). Decisions concerning fit of latent variable models to these data were based on five fit

indexes, the  $\chi^2$  fit index, Bentler Comparative Fit Index (CFI), Tucker-Lewis Fit Index (TLI), Root Mean Square Error Estimate (RMSEA), and Standardized Root Mean Squared Residual (SRMR) (Hu & Bentler, 1995). Additionally, latent variable indicator loadings were examined. For each latent variable retained for subsequent analysis, indicator loadings were statistically significant (with the exception of those preset to 1).

Because analyses were conducted using imputed data sets, Mplus calculated mean fit indexes and their standard deviations. These were used to assess model fit. Mplus does not provide the statistical significance of mean  $\chi^2$  fit indexes. Tables in Tabachnick and Fidell (2001) were used to examine the  $\chi^2$  fit index provided by Mplus. P-close values (probability that  $RMSEA \leq 0.05$ ) and RMSEA confidence intervals (Byrne, 2001, pp. 79 - 85) for mean RMSEA fit indexes were not provided by Mplus for imputed data analyses.

Modification indexes were not available for analyses of multiple imputed data sets. When models were found to provide an unacceptable fit to these data, they were re-specified based on theory or knowledge of the data in an attempt to achieve a better fit. It should be remembered, however, that  $\chi^2$  fit indexes were mean scores, with standard deviations, rather than statistics with  $p$ -values. It seemed inappropriate to rely on differences in  $\chi^2$  as the measure of improvement in fit between nested models. For this reason, all fit indexes were examined for demonstrations of model fit improvement.

Among the child-level latent variables to be specified, there were not identified and just identified latent variables. Not identified latent variables are those for which there is insufficient information to estimate parameters uniquely (Schumacker & Lomax, 1996, p. 100). Just identified latent variables are those for which there is exactly enough information

to estimate parameters uniquely, but insufficient information to examine model fit. Thus, just identified latent variables' fit indexes are not indicative of model-data discrepancies (Kline, 1998, p. 147). For this reason, not identified and just identified models were specified in conjunction with 54-month emotion self-regulation, a two-latent-variable CFA. Emotion self-regulation was selected because it provided an acceptable fit to these data. The working assumption was that if the fit indexes were similar to those of 54-month emotion self-regulation, the latent variable being examined also provided an acceptable fit to these data (personal communication, Sharon Christ, Odum Institute, UNC-CH, August 1, 2006).

The following sections describe CFA used to specify the child-level latent variables. These variables are 54-month emotion self-regulation, 54-month academic achievement, first-grade peer-related social competence, and first-grade academic achievement. Fit indexes for latent variables used in subsequent analyses are presented in Table 3.1 on page 58.

*Fifty-four-month emotion self-regulation.* The indicators of 54-month emotion self-regulation were parent-reported Child Behavior Questionnaire (CBQ) attention focus and behavioral inhibition scale scores, and children's scores on the continuous performance (CPT) and delay of gratification (DOG) tasks. CBQ attention focus and behavioral inhibition items were intermingled on the instrument parents used for their reports. For this reason, it was decided a priori to covary the error terms for these two indicators. This latent variable provided an acceptable fit to these data (see Table 3.1). Emotion self-regulation (54MESR), as described above, was retained for subsequent analyses.

*Fifty-four month academic achievement.* The indicators of 54-month academic achievement were 54-month Woodcock-Johnson Revised (WJ-R) picture vocabulary, letter-

word identification, and applied problems. This latent variable was just identified. For this reason, 54-month academic achievement was specified in conjunction with 54-month emotion self-regulation. The combined latent variables' fit to these data was similar to that of emotion self-regulation alone (see Table 3.1). Thus, it was concluded that 54-month academic achievement provided a good fit to the data. Fifty-four month academic achievement with three WJ-R standard score indicators (54MAA), as described above, was retained for subsequent analyses.

*First-grade peer-related social competence.* The indicators of first-grade peer-related social competence were teacher-reported peer status and SSRS peer-related social competence and observer-reported frequencies of peer activity, shared positive affect with peers, and observer-reported global ratings of positive engagement, prosocial orientation, positive mood, and peer interaction in a positive situation. The fit of this latent variable to the data was poor (mean CFI = 0.64, sd = 0.03; mean TLI = 0.60, sd = 0.02; mean RMSEA = 0.15, sd = 0.00; mean WRMR = 2.19, sd = 0.03). It should be noted that  $\chi^2$  fit indexes are not available for analyses of categorical variables and WRMR (weighted root mean square residual) are provided instead of SRMR. All regression paths of the latent variable on the measured indicators were statistically significant. However, the r-square values for teacher-reported peer status and SSRS peer-related social competence were small in comparison to those of observer reports (teacher-reported peer-status, 0.07; SSRS peer-related social competence respectively, 0.07; peer activity, 0.48; shared positive affect, 0.27; positive engagement, 0.23; positive mood, 0.50; and peer interaction in a positive situation, 0.18). Thus, it was decided to examine two first-grade peer-related social competence latent

variables, teacher-reported first-grade social competence and observer-reported first-grade social competence. The development of these latent variables is discussed next.

*Teacher-reported first-grade peer-related social competence.* The indicators of teacher-reported first-grade peer-related social competence were peer status and SSRS peer-related social competence. This latent variable was not identified. For this reason, teacher-reported first-grade peer-related social competence was specified in conjunction with 54-month emotion self-regulation. The combined model's fit to these data was similar to that of emotion self-regulation alone (see Table 3.1). Thus, it was concluded that teacher-reported first-grade peer-related social competence provided an acceptable fit to these data. Teacher-reported first-grade social competence (G1SC-T), as described above, was retained for subsequent analyses.

*Observer-reported first-grade peer-related social competence.* The indicators of observer-reported first-grade peer-related social competence were frequencies of peer activity, shared positive affect with peers, and global ratings of positive engagement, prosocial orientation, positive mood, and peer interaction in a positive situation. The fit of this latent variable to the data was poor (mean CFI = 0.93, sd = 0.00; mean TLI = 0.92, sd = 0.01; mean RMSEA = 0.08, sd = 0.00; mean WRMR = 0.86, sd = 0.03). It was decided to allow error terms for shared positive affect and positive mood to covary as it seemed reasonable that children who more frequently demonstrated positive affect would be rated as having a more positive mood. Similarly, it was decided to allow error terms for positive engagement and peer activity to covary as it seemed reasonable that children who were rated as more engaged with peers would have higher frequencies of peer activity. However, the fit was not improved (mean CFI = 0.93, sd = 0.00; mean TLI = 0.94, sd = 0.01; mean RMSEA = 0.07, sd = 0.00; mean

WRMR = 0.61, sd = 0.03). Finally, it was decided to eliminate peer interaction in a positive situation because this variable reflected the situation rather than the child's interactions with peers. Observer-reported peer-related social competence with two sets of indicators with error terms covaried, peer activity and positive engagement, shared positive affect and positive mood, and one additional indicator, prosocial, was specified. The model provided an acceptable fit to these data (see Table 3.1). Observer-reported first-grade social competence (G1SC-O), as described above, was retained for subsequent analyses.

*First-grade academic achievement.* The indicators of first-grade academic achievement were first-grade WJ-R word attack skills, letter-word identification, and applied problems, and teacher reports of academic achievement on the Early Childhood Longitudinal Study (ECLS) Language and Literacy subscale, the ECLS Mathematical Thinking subscale, and Mock Report Card mean of reading, written language, and mathematics scores. The fit of this model to the data was poor (mean  $\chi^2(9) = 870.00$ , sd = 29.27; mean CFI = 0.69, sd = 0.01; mean TLI = 0.48, sd = 0.02; mean RMSEA = 0.36, sd = 0.01; mean SRMR = 0.08, sd = 0.00). To improve model fit, it was decided to allow the error terms of WJ-R word attack skills and letter-word identification scores to covary. These scores likely reflect related literacy skills. Additionally, it was decided to allow the error terms of the two ECLS subscales to covary. These data were provided by teachers on similar instruments. These modifications improved the model fit (mean  $\chi^2(7) = 113.80$ , sd = 29.27), mean CFI = 0.96, sd = 0.00; mean TLI = 0.92, sd = 0.00; mean RMSEA = 0.14, sd = 0.00; mean SRMR = 0.04, sd = 0.00). However, fit of this re-specified model was not acceptable. Thus, it was decided to examine two first-grade academic achievement latent variables, child-performance first-grade academic achievement and teacher-reported first-grade academic achievement.



*Child-performance first-grade academic achievement.* The child-performance indicators of first-grade academic achievement were Woodcock-Johnson Revised (WJ-R) word attack skills, letter-word identification, and applied problems. In this model, the error terms of letter-word identification and word attack skills were allowed to covary. Thus, the model was not identified. For this reason, child-performance first-grade academic achievement was specified in conjunction with 54-month emotion self-regulation. The combined model's fit to these data was similar to that of emotion self-regulation alone (see Table 3.1). Thus, it was concluded child-performance first-grade academic achievement provided an acceptable fit to these data. Child-performance first-grade academic achievement with three WJ-R standard score indicators (G1AA-C), as described above, was retained for subsequent analyses.

*Teacher-reported first-grade academic achievement.* The teacher-reported indicators of first-grade academic achievement were the Early Childhood Longitudinal Study (ECLS) Language and Literacy subscale, the ECLS Mathematical Thinking subscale, and Mock Report Card mean of reading, written language, and mathematics scores. This latent variable was just identified. For this reason, teacher-reported first-grade academic achievement was specified in conjunction with 54-month emotion self-regulation. The combined model's fit to these data was similar to that of emotion self-regulation alone (see Table 3.1). Thus, it was concluded child-performance first-grade academic achievement provided an acceptable fit to these data. Teacher-reported first-grade academic achievement with ECLS Language and Literacy, ECLS Mathematical Thinking, and Mock Report Card mean (G1AA-T), as described above, was retained for subsequent analyses.

Table 3.1

## Child-level Latent Variable Fit Indexes

Latent Variable	Mean $\chi^2$ (sd)	Mean CFI (sd)	Mean TLI (sd)	Mean RMSEA (sd)	Mean SRMR (sd)	Mean WRMR (sd)
54MESR	3.28 (0.97) df =1	0.99 (0.00)	0.96 (0.02)	0.05 (0.01)	0.01 (0.00)	
54MAA with 54MESR	15.84 (1.94) df =12	1.00 (0.00)	1.00 (0.00)	0.02 (0.01)	0.02 (0.00)	
G1SC-T with 54MESR	13.77 (1.16) df=7	0.99 (0.00)	0.98 (0.00)	0.04 (0.00)	0.02 (0.00)	
G1SC-O		1.00 (0.00)	1.00 (0.00)	0.00 (0.00)		0.06 (0.01)
G1AA-C with 54MESR	22.96 (1.48) df=11	0.99 (0.00)	0.99 (0.00)	0.04 (0.00)	0.02 (0.00)	
G1AA-T with 54MESR	29.22 (1.68) df=12	0.99 (0.00)	0.98 (0.00)	0.04 (0.00)	0.02 (0.00)	

*Conclusion: Confirmatory factor analyses of child-level latent variables.*

CFA were conducted to specify child-level latent variables. Six child-level latent variables were found to provide acceptable fit to these data. These variables are 54-month emotion self-regulation, 54-month academic achievement, teacher-reported first-grade peer-related social competence, observer-reported first-grade peer-related social competence, child-performance first-grade academic achievement, and teacher-reported first-grade academic achievement. It was decided at this point not examine SEM that included an association between teacher-reported first-grade peer-related social competence and teacher-reported first-grade academic achievement. Using teacher reports for multiple variables

would compromise independence, compromise validity of statistical tests, and adversely affect interpretation of findings (Kerlinger & Lee, 2000, p. 147). Therefore, it was decided to examine teacher-reported social competence only in association with child-performance academic achievement.

Child-level measurement models were examined. Three measurement models were specified. The first measurement model included 54-month emotion self-regulation, 54-month academic achievement, teacher-reported first-grade peer-related social competence, and child-performance first-grade academic achievement. The second measurement model included 54-month emotion self-regulation, 54-month academic achievement, observer-reported first-grade peer-related social competence, and child-performance first-grade academic achievement. The third measurement model included 54-month emotion self-regulation, 54-month academic achievement, observer-reported first-grade peer-related social competence, and teacher-reported first-grade academic achievement. Measurement models were found to provide acceptable fits to these data (see Table 3.2, page 60). Latent variable indicator loadings were statistically significant (with the exception of those preset to one). Covariance paths between latent variables were statistically significant. All measurement models appeared acceptable for further analysis.

Table 3.2

## Child-level Measurement Model Fit Indexes

Measurement model	mean $\chi^2$ (sd)	Mean CFI (sd)	Mean TLI (sd)	Mean RMSEA (sd)	Mean SRMR (sd)	Mean WRMR (sd)
1. 54MESR, 54MAA,G1SC-T, G1AA-C	120.56 (8.62) df = 46	0.98 (0.00)	0.97 (0.00)	0.05 (0.00)	0.03 (0.00)	
2. 54MESR, 54MAA,G1SC-O, G1AA-C		0.97 (0.00)	0.97 (0.00)	0.04 (0.00)		0.79 (0.02)
3. 54MESR, 54MAA,G1SC-O, G1AA-T		0.99 (0.00)	0.99 (0.00)	0.02 (0.00)		0.60 (0.00)

*Exploratory Factor Analyses of Classroom-Level Variables.*

Prior NICHD SECC analyses have defined two classroom process factors, emotional support and instructional support (NICHD Early Child Care Research Network, 2002). These factors were extracted using principal components analysis, with varimax rotation. Principal components analysis is based on the assumption that observed scores are perfectly reliable. Because scores are “never perfectly reliable” (Thompson, 2004, p. 36), results are based on an erroneous assumption. To account for measurement error, principal axis factor analysis (SPSS 14.0) was conducted for the dissertation data. Orthogonal and oblique solutions were investigated. While it was expected that two factors similar to those revealed by the prior principal components analysis would be found, it was important to extract factors using a method more appropriate to these data.

Eleven indicators of classroom processes were submitted to exploratory factor analysis. All indicators were observer-reported COS-1 global, qualitative ratings of classroom and teacher. Classroom ratings included classroom over-control, positive emotional climate,

negative emotional climate, effective classroom management, literacy instruction, evaluative feedback, instructional conversation, and child responsibility. Teacher ratings included teacher sensitivity, teacher intrusiveness, and teacher detachment

Preliminary, unrotated principal component analysis suggested a two factor solution. Orthogonal (varimax rotation) and oblique (direct oblimin) principal axis factor analyses were conducted (for details, see Appendix 1). Factor loadings are presented in Table 3.3, page 62. Orthogonal and oblique solutions were similar. For both orthogonal and oblique solutions, the first factor included teacher sensitivity, intrusiveness (reversed), and detachment (reversed), and classroom positive emotional climate, negative emotional climate (reversed), and over control (reversed). This factor included items related to emotional support. For both orthogonal and oblique solutions, the second factor included classroom evaluative feedback, instructional conversation, literacy instruction, child responsibility, and effective classroom management. This factor included items related to instructional support. These factors were similar, but not identical to prior analyses of NICHD SECC data (NICHD Early Child Care Research Network, 2002). Correlation of the oblique factors was 0.55, implying a shared variance of 30.25%. Internal reliabilities (Cronbach's alpha) for these data were 0.90 (emotional support) and 0.75 (instructional support).

Table 3.3

## Indicator Loadings from Orthogonal and Oblique Exploratory Factor Analyses

Indicators	Factor loadings from principal axis factor analysis with varimax (orthogonal) rotation		Factor loadings from principal axis factor analysis with oblim (oblique) rotation	
	Factor 1	Factor 2	Factor 1	Factor 2
Teacher intrusiveness (reversed)	0.88	0.12	0.97	-0.17
Classroom overcontrol (reversed)	0.85	0.19	0.91	-0.09
Teacher sensitivity	0.72	0.50	0.66	0.32
Classroom positive emotional climate	0.67	0.53	0.60	0.37
Classroom negative emotional climate (reversed)	0.67	0.29	0.67	0.10
Teacher detachment (reversed)	0.55	0.34	0.52	0.19
Classroom evaluative feedback	0.09	0.69	-0.13	0.75
Classroom instructional conversation	0.22	0.58	0.06	0.59
Classroom literacy instruction	0.16	0.51	0.02	0.53
Classroom encouragement of child responsibility	0.35	0.51	0.23	0.46
Classroom effective management	0.39	0.51	0.29	0.44

### *Conclusion: Measure Development*

Preliminary CFA and EFA were used to specify the latent variables to be used in this dissertation study's SEM. Six child-level and two classroom-level latent variables were specified. There were four measured variables. The child-level latent variables were 54-month emotion self-regulation, 54-month academic achievement, teacher-reported first-grade peer-related social competence, observer-reported first-grade peer-related social competence, teacher-reported first-grade academic achievement, and child-performance first-grade academic achievement. The class-room level latent variables were classroom emotional support and classroom instructional support. The measured variables were gender, child ethnicity, mothers' education level, and income-to-needs ratio means.

## CHAPTER IV

### RESULTS

#### *Descriptive Analyses*

Descriptive analyses (SPSS 14.0) were conducted for the dissertation sample and are available in Table 4.1. Previous reports of analyses of NICHD SECC data have statistically controlled for effects of children's gender, ethnicity, and family socioeconomic status (NICHD Early Child Care Research Network, 2001, 2003c, 2004a). For this reason, it was decided to control for these effects in dissertation analyses. Nonetheless, descriptive analyses by gender, child ethnicity, family financial status, and mothers' education levels were conducted and results are available upon request.

Table 4.1

Means, Standard Deviations, Medians, Minimums, and Maximums

Variable	N	Mean	Standard deviation	Median	Minimum	Maximum
54-month CPT proportion of correct responses	676	0.75	0.18	0.80	0.16	1.00
54-month DOG time waited	649	4.57	2.98	7.00	0.00	7.00
54-month CBQ inhibitory control	709	4.66	0.76	4.70	2.00	6.40



Variable	N	Mean	Standard deviation	Median	Minimum	Maximum
54-month CBQ attention focus	705	4.69	0.87	4.76	1.25	6.88
54-month WJ-R picture vocabulary	707	101.17	14.15	101.00	42.00	143.00
54-month WJ-R letter-word identification	707	99.35	12.93	98.00	63.00	163.00
54-month WJ-R applied problems	707	103.63	14.97	104.00	41.00	144.00
Teacher-reported peer status	733	16.25	3.06	17.00	5.00	20.00
Teacher-reported peer competence	735	15.35	3.61	16.00	4.00	20.00
Peer activity	692	14.98	4.82	16.00	0.00	20.00
Shared positive affect	692	2.86	3.82	1.25	0.00	19.00
Engaged	692	18.09	2.65	18.89	3.16	20.00
Positive Mood	692	4.91	1.19	5.00	1.00	7.00
Prosocial	692	2.37	1.43	2.00	1.00	7.00
Peer interaction in positive situation	692	1.92	0.95	2.00	0.00	3.00
1 <sup>st</sup> grade WJ-R word attack skills	708	109.15	13.74	110.50	77.00	143.00
1 <sup>st</sup> grade WJ-R letter-word identification	709	112.99	14.89	113.00	65.00	150.00
1 <sup>st</sup> grade WJ-R applied problems	707	111.63	16.65	112.00	57.00	163.00

Variable	N	Mean	Standard deviation	Median	Minimum	Maximum
Teacher-reported ECLS-K language and literacy	737	3.38	0.93	3.47	1.07	5.00
Teacher-reported ECLS-K mathematical thinking	736	3.22	0.94	3.25	1.00	5.00
Mean of mock report card grades	739	3.35	0.95	3.33	1.00	5.00
Sensitivity	694	5.30	1.13	5.33	1.33	7.00
Intrusiveness (reversed)	694	6.11	1.13	6.50	1.00	7.00
Detachment (reversed)	694	6.51	0.77	7.00	2.67	7.00
Over control (reversed)	694	5.58	1.53	6.00	1.00	7.00
Positive emotional climate	694	5.32	1.30	5.00	1.00	7.00
Negative emotional climate	694	6.40	1.10	7.00	1.00	7.00
Classroom management	694	5.00	1.32	5.00	1.00	7.00
Literacy instruction	694	5.13	1.23	5.00	1.00	7.00
Evaluative feedback	694	3.27	1.53	3.00	1.00	7.00
Instructional conversation	694	3.15	1.55	3.00	1.00	7.00
Child responsibility	694	4.21	1.36	4.00	1.00	7.00

### *Analytical Strategies*

This dissertation study asked research questions about mediation and moderation. Both mediation and moderation concern the role a third variable plays in an independent-dependent variable association. The roles played by mediators and moderators in such associations are very different. According to Baron and Kenny (1986), mediation explains how or why an independent variable influences a dependent variable. On the other hand, moderation explains conditions that affect the strength and/or direction of the independent variable's influence on the dependent variable. Specific criteria for mediation and moderation as explained by Baron and Kenny are discussed below in the context of this dissertation study's research questions. Mediation is discussed first, moderation is discussed thereafter.

Baron and Kenny (1986) have described mediation as a mechanism by which an independent variable's influence reaches a dependent variable. One of this dissertation study's research questions was concerned with mediation. This question asked, "Does first-grade peer-related social competence mediate 54-month emotion self-regulation's influence on first-grade academic achievement?" Before this research question could be addressed, it was necessary to satisfy Baron and Kenny's preliminary criteria.

Baron and Kenny (1986) defined three preliminary criteria for mediation. First, variation of the independent variable must account for variation in the presumed mediator. Second, variation in the presumed mediator must account for variation in the dependent variable. Finally, variation of the independent variable must account for variation in the dependent variable. Only when these criteria are met can a test of mediation be conducted. To demonstrate mediation, the "previously significant relation between the independent and

dependent variables is no longer significant” (p. 1176), when associations of independent and presumed mediator, and presumed mediator and dependent are controlled. However, Baron and Kenny go on to say that examining phenomena such as those examined in this dissertation study, it may be more reasonable “to seek mediators that significantly decrease” (p.1176) the independent-dependent variable association, rather than those which eliminate it. Prior to examining the complete mediation model, it was necessary to examine research questions based on Baron and Kenny’s preliminary criteria.

Baron and Kenny’s (1986) preliminary criteria led to three subsidiary research questions. First, do better regulated preschoolers become more socially competent first graders? Second, do more socially competent first graders have higher academic achievement? Finally, do better regulated preschoolers have higher academic achievement in first grade? Only after each of these questions was affirmatively answered could the mediation research question be examined. This research question asked whether first-grade social competence provided a mechanism through which children’s 54-month emotion self-regulation influenced their first grade academic achievement, be examined.

Baron and Kenny (1986) have also described a moderator as a variable that “affects the direction and/or strength” (p. 1174) of an independent-dependent variable association. Three of this dissertation study’s research questions were concerned with moderation. The first of these question asked, “Does instructional support moderate emotion self-regulation’s influence on first-grade academic achievement?” The second asked, “Does emotional support moderate emotion self-regulation’s influence on first-grade academic achievement?” The third asked, “Does emotional support moderate emotion self-regulation’s influence on first-grade peer-related social competence?”

The examination of moderation involves the creation of a new variable. This variable is an interaction term, the product of the independent variable and the presumed moderator variable. To determine whether the presumed moderator does, in fact, moderate the association of the independent and dependent variables, the dependent variable is regressed on the independent variable, the presumed moderator variable, and the interaction term. A statistically significant regression path of the dependent on the interaction term is evidence of moderation (p.1174). If moderation is supported, post hoc analyses are used to examine and interpret the interaction (Aiken & West, 1991).

### *Analysis of Mediation*

Following Baron and Kenny (1986), three preliminary criteria were met prior to the mediation analysis. SEM were used to examine the three subsidiary research questions. Preliminary models were modified, as necessary, to improve fit to these data. Preliminary models that provided the best fit to these data were used in subsequent analyses. Preliminary models are discussed below. Mplus does not provide standardized path estimates for analyses involving imputed data sets. Standardized path estimates and accompanying standard deviations were calculated from estimates provided by individual analyses of the imputed data sets. A discussion of the mediation analysis models follows.

### *Preliminary Mediation Criteria SEM*

*Association of independent and presumed mediator variables.* The first preliminary criterion examined was the association of 54-month emotion self-regulation and first-grade peer-related social competence. This analysis was used to answer the first subsidiary research question: Do better regulated preschoolers become more socially competence first graders? In separate analyses, teacher-reported first-grade peer-related social competence

and observer-reported first-grade peer-related social competence were regressed on fifty-four month emotion self-regulation. In each analysis, the effects of gender, ethnicity, mothers' education level, and income-to-needs ratio mean on social competence were controlled. The association of 54-month emotion self-regulation and observer-reported first-grade peer-related social competence is discussed first. The association of 54-month emotion self-regulation and teacher-reported first-grade peer-related social competence is discussed thereafter.

SEM used to examine 54-month emotion self-regulation's influence on observer-reported first-grade peer-related social competence did not provide an acceptable fit to these data (mean CFI = 0.72, sd = 0.02; mean TLI = 0.71, sd = 0.02; mean RMSEA = 0.08, sd = 0.00, mean WRMR = 1.62, sd = 0.04). Additionally, the regression path was not statistically significant (path estimate = 1.76, estimate/standard error = 1.47). Because this regression path was not statistically significant, observer-reported first-grade peer-related social did not meet the preliminary mediation criterion. For this reason, observer-reported first-grade peer-related social competence was not subsequently examined as a mediator.

SEM used to examine 54-month emotion self-regulation's influence on teacher-reported first-grade peer-related social competence provided an acceptable fit to these data (mean  $\chi^2(28) = 72.59$ , sd = 3.10; mean CFI = 0.95, sd = 0.00; mean TLI = 0.92, sd = 0.01; mean RMSEA = 0.05, sd = 0.00, mean SRMR = 0.03, sd = 0.00) (see Figure 3.1). Additionally, the regression path was statistically significant (path estimate = 2.99, standardized path estimate = 0.53, estimate/standard error = 4.11). Because this regression path was statistically significant, teacher-reported social competence met the first preliminary mediation criterion. Because only teacher-reported peer-related social competence was

found to be a viable mediator, only child-performance first-grade academic achievement was used in subsequent analyses (see measure development section of the Methods chapter, pp. 50 - 63)

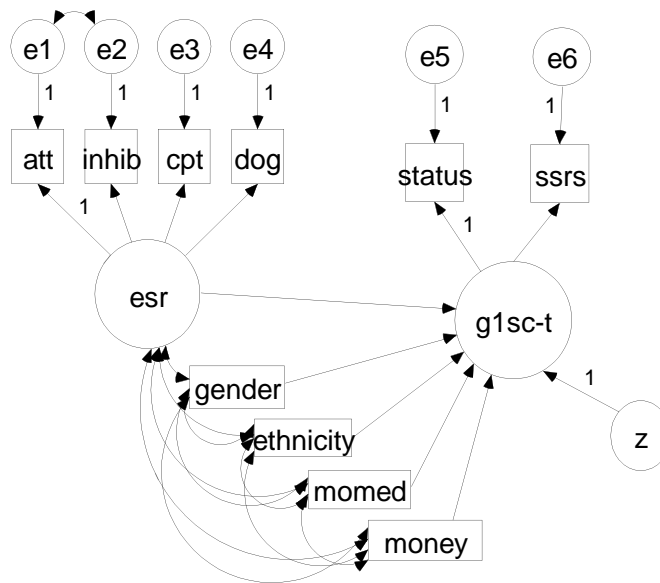


Figure 4.1. First preliminary mediation criterion analysis SEM: The influence of 54-month emotion self-regulation on teacher-reported first-grade peer-related social competence

*Association of presumed mediator and dependent variables.* The second preliminary mediation criterion examined was the association of teacher-reported first-grade peer-related social competence and child-performance academic achievement. This analysis was used to answer the second subsidiary research question: Do more socially competent first graders have higher academic achievement? In this analysis, child-performance first-grade academic achievement was regressed on teacher-reported first-grade peer-related social competence. The effects of gender, ethnicity, mothers' education level, income-to-needs ratio mean, and children's fifty-four month academic achievement on first-grade academic achievement were controlled. The fit of this model to these data was not acceptable (mean  $\chi^2(36) = 190.49$ , sd = 7.57; mean CFI = 0.95, sd = 0.00; mean TLI = 0.92, sd = 0.00; mean RMSEA = 0.08, sd = 0.00; mean SRMR = 0.03, sd = 0.00).

To improve the model fit, SEM was modified. Modifications were made in the variable used to control for effects of children's existing cognitive abilities. Fifty-four month academic achievement had three indicators, WJ-R letter-word identification, word attack skills, and picture vocabulary. Woodcock-Johnson Revised includes two scales, Academic Achievement and Cognitive Abilities. Letter-word identification and applied problems are two of three achievement subscales. Picture vocabulary is one of four Cognitive Ability subscales. In an effort to improve model fit, it was decided to examine two new models. In the first model, a reduced 54-month academic achievement latent variable with two indicators, letter-word identification and applied problems, was used in place of the original, three-indicator latent variable. In the second model, only picture vocabulary scores were used. Other researchers have used picture vocabulary scores to control for the influence of children's existing cognitive abilities in studies examining emotion self-regulation's



influence on academic achievement (Coplan et al., 1999; Miech et al., 2001; Schoen & Nagle, 1994).

The first modified SEM, with the reduced 54-month academic achievement latent variable, improved the fit (mean  $\chi^2(26) = 105.31$ ,  $sd = 5.21$ ; mean CFI = 0.97,  $sd = 0.00$ ; mean TLI = 0.95,  $sd = 0.00$ ; mean RMSEA = 0.06,  $sd = 0.00$ ; mean SRMR = 0.02,  $sd = 0.00$ ). The second modified model, with 54-month WJ-R picture vocabulary scores as a control, provided an acceptable fit (mean  $\chi^2(18) = 39.26$ ,  $sd = 0.02$ ; mean CFI = 0.99,  $sd = 0.00$ ; mean TLI = 0.98,  $sd = 0.00$ ; mean RMSEA = 0.04,  $sd = 0.00$ ; mean SRMR = 0.02,  $sd = 0.00$ ) (see Figure 4.2). The regression path of child-performance academic achievement on teacher-reported first-grade peer-related social competence was small, but statistically significant (path estimate = 0.56, standardized path estimate = 0.14, estimate/standard error = 2.60). Because this regression path was statistically significant, teacher-reported first-grade peer-related social competence met the second preliminary mediation criterion. Only one preliminary mediation criterion remained to be examined.

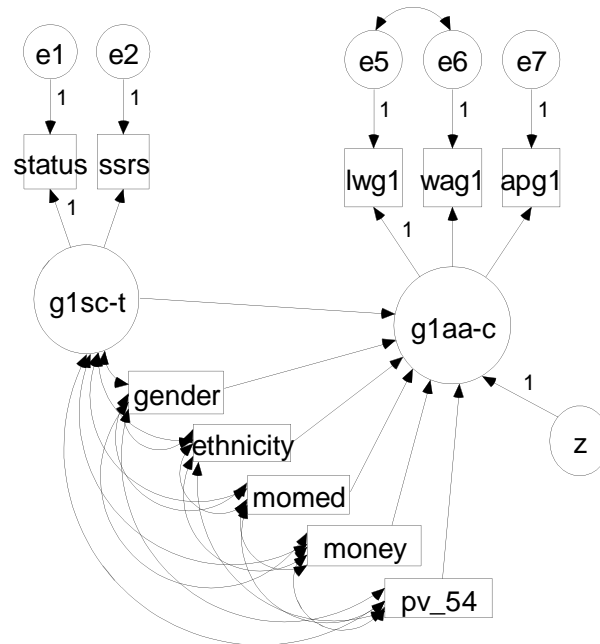


Figure 4.2. Second preliminary mediation criterion analysis SEM: The influence of teacher-reported first-grade peer-related social competence on child-performance first-grade academic achievement.

*Association of independent and dependent variables.* The final preliminary criterion examined was the association of 54-month emotion self-regulation and child-performance first-grade academic achievement. This analysis was used to answer the third subsidiary research question: Do better regulated preschoolers have higher academic achievement in first grade? In this analysis, child-performance academic achievement was regressed on 54-month emotion self-regulation. The effects of gender, ethnicity, mothers' education level, income-to-needs ratio mean, and 54-month WJ-R picture vocabulary (as per the preceding analysis of the association of social competence and academic achievement) were controlled. This model provided an acceptable (mean  $\chi^2(36) = 100.35$ , sd = 4.41; mean CFI = 0.97, sd = 0.00; mean TLI = 0.95, sd = 0.00; mean RMSEA = 0.05, sd = 0.00; mean SRMR = 0.03, sd = 0.00) (see Figure 4.3). Additionally, the regression path was statistically significant (path estimate = 21.59, standardized path estimate = 0.86, estimate/standard error = 4.76). Having met the final preliminary criterion for mediation, the complete mediation model could be examined.

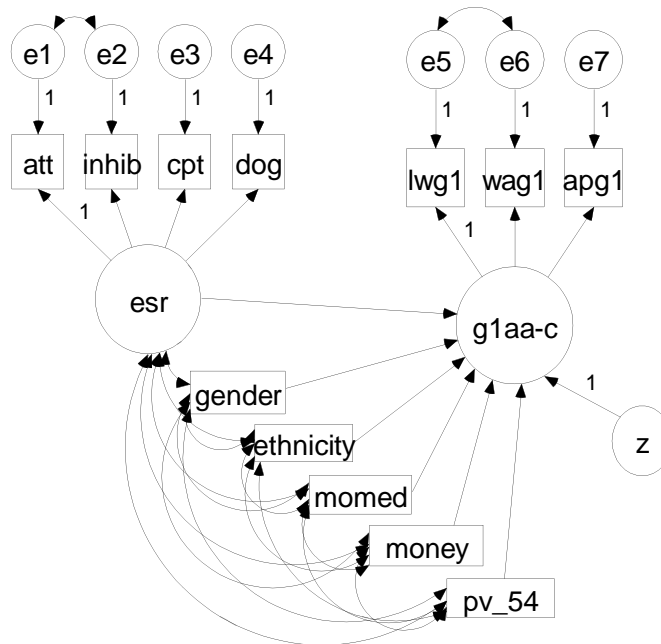


Figure 4.3. Third preliminary mediation criterion analysis SEM: The influence of 54-month emotion self-regulation on child-performance first-grade academic achievement

### *Structural Model Specification: The Mediation Model*

Having satisfied the preliminary criteria for an analysis of mediation described by Baron and Kenney (1986), it was possible to conduct the mediation analysis. In this analysis, three child-level latent variables and five measured variables were used. The child-level latent variables were 54-month emotion self-regulation, the independent variable, teacher-reported first-grade peer-related social competence, the presumed mediator variable, and child-performance academic achievement, the dependent variable. The five measured variables, gender, ethnicity, mothers' level of education, income-to-needs ratio mean, and 54-month WJ-R picture, were control variables.

The mediation SEM examined whether the association of 54-month emotion self-regulation and child-performance first-grade academic achievement remained significant, after accounting for the associations of 54-month emotion self-regulation and teacher-reported first-grade peer-related social competence, and of teacher-reported first-grade peer-related social competence and child-performance first-grade academic achievement. The effects of gender, ethnicity, mothers' education levels, and income-to-needs ratio means on teacher-reported first-grade peer-related social competence were controlled. These effects, along with those of 54-month WJ-R picture vocabulary scores, on child-performance first-grade academic achievement were also controlled. The model's fit to these data was (mean  $\chi^2(53) = 121.04$ ,  $sd = 2.93$ , mean CFI = 0.97,  $sd = 0.00$ ; mean TLI = 0.96,  $sd = 0.00$ ; mean RMSEA = 0.04,  $sd = 0.00$ ; mean SRMR = 0.03,  $sd = 0.00$ ) was acceptable (see Figure 4.4).

Two of three regression paths in the mediation model remained statistically significant. First, the association of 54-month emotion self-regulation and teacher-reported first-grade peer-related social competence remained statistically significant (path estimate = 3.00,

standardized path estimate = 0.49, estimate/standard error = 5.28). Second, the association of 54-month emotion self-regulation and child-performance first-grade academic achievement remained statistically significant (path estimate = 22.05, standardized path estimate = 0.88, estimate/standard error = 4.88). Not only did the independent-dependent variable association remain statistically significant, it remained approximately the same as in the preliminary analysis (path estimate = 21.59, standardized path estimate = 0.86, estimate/standard error = 4.76). Thus, teacher-reported first-grade peer-related social competence was not supported as a mediator of the association of 54-month emotion self-regulation and child-performance first-grade academic achievement. Additionally, in this analysis, the previously small, but statistically significant association of teacher-reported first-grade peer-related social competence and child-performance first-grade academic achievement (path estimate = 0.56, standardized path estimate = 0.14, estimate/standard error = 2.60) was no longer statistically significant (path estimate = -0.56, standardized path estimate = -0.14, estimate/standard error = -1.72). From this analysis, it appears that children's social competence with peers and their early academic achievement both have roots in emotion self-regulation. It also appears that children's social competence may not make the important contribution to academic achievement often ascribed to it (Ladd, 1990; Ladd et al., 1999).

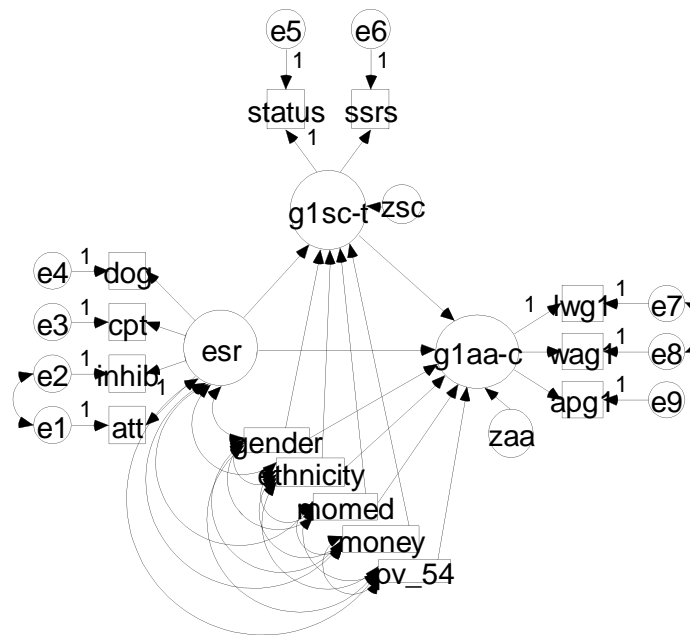


Figure 4.4. Mediation model: The influence of 54-month emotion self-regulation on child-performance first-grade academic achievement, accounting for the associations of 54-month emotion self-regulation and teacher-reported first-grade peer-related social competence, and of teacher-reported first-grade peer-related social competence and child-performance first grade academic achievement

### *Analysis of Moderation*

Following Baron and Kenny (1986), this dissertation study examined three research questions concerning moderation. The first question asked, “Does instructional support moderate emotion self-regulation’s influence on first-grade academic achievement?” The second question asked, “Does emotional support moderate emotion self-regulation’s influence on first-grade academic achievement?” The third question asked, “Does emotional support moderate emotion self-regulation’s influence on first-grade peer-related social competence?” To answer these questions, three new structural equation models were specified. First, instructional support was examined as a possible moderator of 54-month emotion self-regulation’s association with child-performance first-grade academic achievement. Next, emotional support was examined as a possible moderator of 54-month emotion self-regulation’s association with teacher-reported first-grade peer-related social competence. Finally, emotional support was examined as a possible moderator of 54-month emotion self-regulation’s association with child-performance first-grade academic achievement.

Instructional support and emotional support were continuous latent variables. Although it is possible to test continuous variable moderators by creating categories, this method would have sacrificed variance. Mplus (Muthen & Muthen, 2006) supports studies of moderation by allowing interaction between two continuous latent variables. It should be noted that Mplus centers independent and presumed moderator variables in moderation models (Linda Muthen, personal communication, October 6, 2006). However, Mplus 4.0 provides neither fit indexes nor standardized path estimates for moderation models. Additionally, the moderation analysis variances and residual variances provided by Mplus are not appropriate



for calculating standardized path estimates (Linda Muthen, personal communication, May 15, 2007). Thus, it was only possible to examine unstandardized path estimates. Path estimates are available in Table 3.2.

#### *Moderation by Instructional Support*

The first moderation SEM examined whether classroom instructional support moderated 54-month emotion self-regulation's influence on child-performance first-grade academic achievement. In this structural model, an interaction term, the product of emotion self-regulation and instructional support, was defined. Child-performance first-grade academic achievement was regressed on 54-month emotion self-regulation, instructional support, and the interaction term. The effects of child gender, ethnicity, mothers' education levels, family income-to-needs ratio means, and children's 54-month WJ-R picture vocabulary scores on child-performance first-grade academic achievement were controlled. Emotion self-regulation's influence on child-performance first-grade academic achievement was statistically significant (path estimate = 17.95, estimate/standard error = 5.19). Neither instructional support nor the interaction term significantly influenced child-performance first-grade academic achievement (instructional support path estimate = -0.41, estimate/standard error = -0.66; interaction term path estimate = 0.04, estimate/standard error = 0.02). Because the interaction term's influence on child-performance first-grade academic achievement was not statistically significant, it was concluded that instructional support did not moderate the association of emotion self-regulation and child-performance first-grade academic achievement.

### *Moderation by Emotional Support*

The remaining moderation SEMs examined whether classroom emotional support moderated 54-month emotion self-regulation's influence on either teacher-reported first-grade peer-related social competence or child-performance first-grade academic achievement. In each analysis, a new interaction term, the product of emotional support and 54-month emotion self-regulation was defined. Results of these analyses are discussed below.

The second moderation SEM examined whether classroom emotional support moderated 54-month emotion self-regulation's influence on teacher-reported first-grade peer-related social competence was examined. In this structural model, teacher-reported first-grade peer-related social competence was regressed on 54-month emotion self-regulation, emotional support, and the interaction term. The effects of child gender, ethnicity, mothers' education levels, and family income-to-needs ratio means were controlled. Emotion self-regulation's influence on teacher-reported first-grade peer-related social competence was statistically significant (path estimate = 3.12, estimate/standard error = 3.33). Neither emotional support nor the interaction term significantly influenced teacher-reported first-grade peer-related social competence (emotional support path estimate = -0.14, estimate/standard error = -0.85; interaction term path estimate = -0.10, estimate/standard error = -0.07). Because the interaction term's influence on teacher-reported first-grade peer-related social competence was not statistically significant, it was concluded that, contrary to expectations, emotional support did not moderate the association of emotion self-regulation and teacher-reported first-grade peer-related social competence

The final moderation SEM examined whether emotional support moderated 54-month emotion self-regulation's influence on child-performance first-grade academic achievement. In this structural model, child-performance first-grade academic achievement was regressed on 54-month emotion self-regulation, emotional support, and the interaction term. Effects of child gender, ethnicity, mothers' education levels, family income-to-needs ratio means, and 54-month WJ-R picture vocabulary scores were controlled. Emotion self-regulation's influence on child-performance first-grade academic achievement was statistically significant (path estimate = 19.45, estimate/standard error = 5.19). Both emotional support and the interaction term significantly influenced child-performance first-grade academic achievement (emotional support path estimate = -1.36, estimate/standard error = -2.73; interaction term path estimate = 2.49, estimate/standard error = 1.99).

Because emotional support was found to moderate 54-month emotion self-regulation's association with child-performance first-grade academic achievement, a post hoc analysis was conducted. The purpose of the post hoc analysis was to examine the association of 54-month emotion self-regulation and child-performance first-grade academic achievement at various levels of emotional support. For the analysis, a linear regression equation (Equation 1) was used. In this equation, the dependent variable was child-performance first-grade academic achievement (*aa*). The independent variables were emotion self-regulation (*r*), emotional support (*s*), and the interaction term variable (the product of *r* and *s*). Contributions of control variables, gender (*g*), child ethnicity (*e*), mothers' education level (*m*), family income-to-needs ratio mean scores (*i*), and children's 54-month WJ-R picture vocabulary scores (*a*) were controlled. Additionally, to align calculated child-performance first-grade academic achievement values with WJ-R standard scores, 100 was added to the

constant term. One hundred was selected because WJ-R standard scores are based on a mean of 100. Path estimates from the moderation analysis were used as regression coefficients (italicized capital letters).

$$aa = [100 + G(g) + E(e) + M(m) + I(i) + A(a)] + R(r) + S(s) + M(r \times s) \quad (1)$$

Structural equation modeling used in this study examined associations of latent variables. Because latent variables are not directly measured, there were no measured values for 54-month emotion self-regulation and emotional support. For this reason, emotion self-regulation and emotional support factor scores (*r* and *s* respectively) were calculated (Mplus). Factor scores are estimated values for unobserved factors or latent variables (Johnson & Wichern, 2002, p. 510). From factor score distributions, emotion self-regulation and emotional support factor score values at eleven levels (-2.5, -2.0, -1.5, -1.0, -0.5, 0.0, 0.5, 1.0, 1.5, 2.0, 2.5 standard deviations) were calculated. These factor score values were used as the values of emotion self-regulation and emotional support in the regression equation.

Moderator factor score values (*r*  $\times$  *s*) were calculated from those of 54-month emotion self-regulation and emotional support. Weighted mean values for gender (*g*), child ethnicity (*e*), mothers' education levels (*m*), family income-to-needs ratio mean scores (*i*), and children's preschool cognitive ability (*p*) were used in all equations as the values for those variables.

The regression equation was solved 121 times. At each of the 11 standard-deviation levels of emotional support (from -2.5 sd to +2.5 sd), the equation was solved for the 11 emotion self-regulation factor score values (from -2.5 sd to +2.5 sd). Subsequently, at each level of emotional support, the calculated child-performance first-grade academic achievement values were plotted as a function of 54-month emotion self-regulation. In order to examine differences between emotional support levels, five emotional-support levels were

plotted on one graph. Figure 4.5 presents calculated child-performance first-grade academic achievement values as a function of 54-month emotion self-regulation at -2.0, -1.0, 0, +1.0, and +2.0 standard deviations of emotional support.

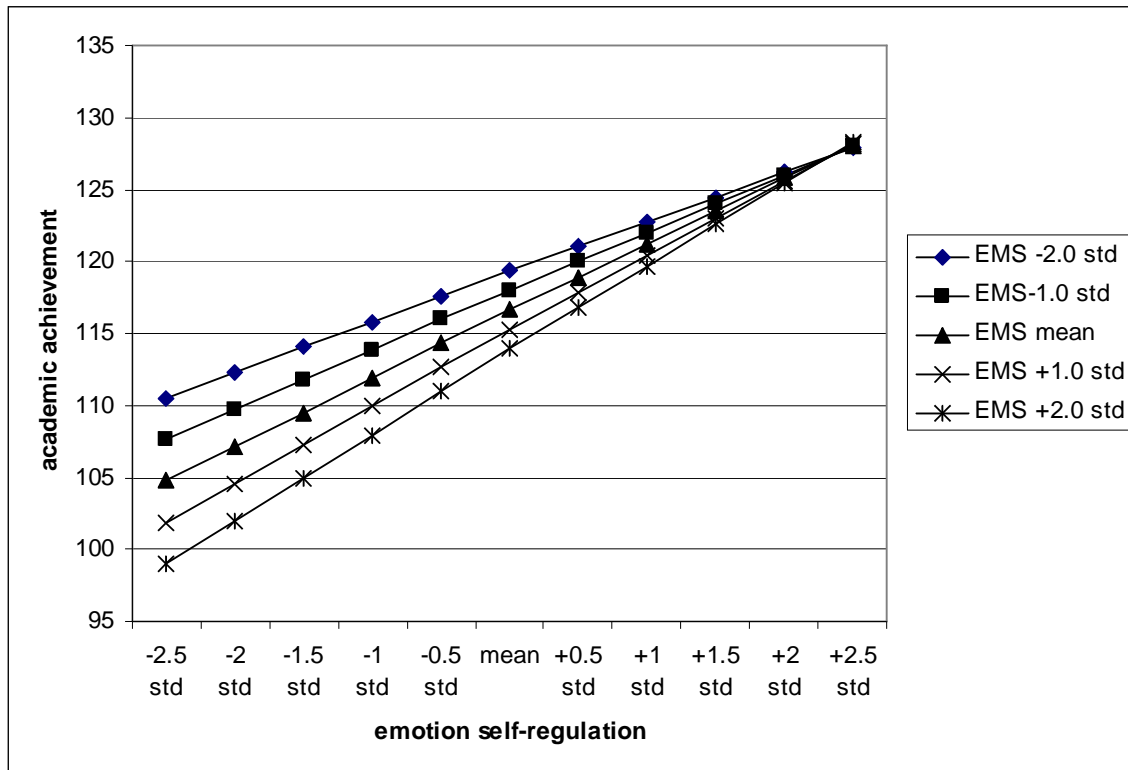


Figure 4.5. Post Hoc Analysis Graph: First-grade child-performance academic achievement as a function of 54-month emotion self-regulation at five levels of emotional support.

Contrary to expectation, less well-regulated children did not appear to benefit from higher levels of emotional support. From the graph, it appears that less well-regulated children had higher levels of academic achievement in classroom where less emotional support was provided. Across emotional support levels, differences in academic achievement appear to diminish as children's emotion self-regulation increases.

## CHAPTER V

### DISCUSSION

Using data drawn from the NICHD SECC Phase I and Phase II data, this dissertation study examined the influences of child characteristics and classroom processes on children's early school adjustment. First, this study examined the role of children's 54-month emotion self-regulation in social and academic aspects of their first-grade school adjustment. Next, this study examined whether emotion self-regulation's association with these aspects of school adjustment was affected by two classroom processes, instructional support and emotional support. This chapter summarizes and discusses findings of SEM analyses used to examine emotion self-regulation's association with early school adjustment and whether it was changed by classroom instructional support and emotional support.

#### *Emotion Self-regulation and Early School Adjustment*

This study examined whether children's first-grade peer-related social competence was a mechanism by which 54-month emotion self-regulation influenced first-grade academic achievement. This question resulted from two distinct theories. One theory has suggested that positive peer relationships may provide an important context for achievement (Ladd et al., 2004; Ladd & Kochenderfer, 1996). From this perspective, well regulated children, who are better liked by peers (Eisenberg et al., 1997b; Raver et al., 1999), are expected to receive peer encouragement and support for learning (Parker & Asher, 1989), engage more fully in classroom activities (Ladd & Kochenderfer, 1996), and reap greater benefit from classroom

instruction (Ladd et al., 1997). Thus, social competence would be expected to mediate emotion self-regulation's association with academic achievement. On the other hand, a second theory has posited that, as children start school, they are beginning to use prosocial strategies to access environmental resources (Hawley, 1999). From this point of view, well regulated children would be expected to cooperate with teachers and peers (Denham et al., 2003; Eisenberg et al., 1997b), comply with requests and rules (Kochanska & Knaack, 2003; Smith, 2001), solve social and academic problems constructively (Oppen, 2003), persist at difficult tasks (Eisenberg et al., 2000; Oppen, 2003), engage more fully in classroom activities (Graziano, Reavis, Keane, & Calkins, 2007; Ladd & Burgess, 2001) and, thus, be more socially and academically successful (Fantuzzo et al., 2004; Raver et al., 1999). If this were the case, social competence would not be expected to mediate emotion self-regulation's association with academic achievement. As there were neither theoretical nor empirical reasons to favor either possibility, there was no hypothesis.

Evidence from this study indicated that peer-related social competence did not mediate emotion self-regulation's association with academic achievement. Fifty-four-month emotion self-regulation retained its statistically significant, positive influence on first-grade academic achievement, with the contributions of first-grade peer-related social competence, gender, ethnicity, family background, and 54-month cognitive abilities controlled. Additionally, 54-month emotion self-regulation was positively associated with first-grade peer-related social competence, above and beyond the contributions of gender, ethnicity, and family background. These findings tend to indicate that, at least during the transition to school, peer-related social competence may not provide the important support system for academic achievement posited by Ladd and colleagues (Ladd et al., 2004; Ladd & Kochenderfer,

1996). Rather, this analysis tends to indicate that young children's positive relationships with classmates and their mastery of basic academic skills are both rooted in early emotion self-regulation.

Each of the mediation model associations will be discussed more fully below. First, 54-month emotion self-regulation's association with first-grade peer-related social competence will be examined. Then, the association of emotion self-regulation and first-grade academic achievement will be considered. Finally, the association of first-grade peer-related social competence and academic achievement will be discussed. Each section includes connections to theory and prior research. Limitations of the mediation analysis and the future directions they suggest are also discussed.

*Fifty-four-month Emotion Self-regulation and First-grade Peer-related Social Competence.*

This study found that well regulated preschoolers became more socially competent first-graders. This finding is consistent with Hawley's (1999) theory that successful resource control underlies social dominance. If, as Hawley (1999) posits, prosocial resource control strategies become increasingly important during the early school years, then children who use these strategies likely access school's social resources more effectively. Halberstadt and colleagues (Halberstadt, Denham, & Dunsmore, 2001) have posited that such prosocial strategies likely include abilities to interpret messages accurately, regulate affective responses, and select and deploy contextually appropriate behaviors. In general, research suggests that well regulated children are more likely to use such prosocial resource control strategies (Eisenberg et al., 2004a; Garner & Estep, 2001; Hubbard & Coie, 1994; Rothbart, Ahdai, & Hershey, 1994). The association of children's emotion self-regulation and social



competence found in this study lends support to Hawley's theory (1999) and implies that well regulated children more effectively access school's social resources.

Additionally, this study's findings were consistent with prior research suggesting that, in general, well regulated children are more socially competent than their less well regulated peers (Eisenberg et al., 2004a; Hubbard & Coie, 1994). Emotion self-regulation's association with social competence has been demonstrated using peer- and adult-reported social competence measures (Eisenberg et al., 2003; Raver et al., 1999). In general, peers have expressed preference for well regulated children (Denham et al., 2003; Eisenberg et al., 2000; Smith, 2001). Perhaps this is because peers find well regulated children easier to get along with (Cumberland-Li et al., 2004). Additionally, adults have often reported that well regulated children are more socially competent (Eisenberg et al., 1997b; Raver & Zigler, 1997), more popular (Spinrad et al., 2006), and better liked (Eisenberg et al., 1997b) than are less well regulated children.

Finally, this study's findings are consistent with findings from special education research. One strand of this research has examined social competence among children with attention deficit/hyperactivity disorder (AD/HD). These are children who have been clinically identified as having difficulties controlling attention and/or inhibiting behaviors in contextually appropriate ways (American Psychiatric Association, 1994). Research involving children with AD/HD implies the importance of emotion self-regulation to social competence when it reports that these children often have "more social problems than children without AD/HD" (see Stormont, 2001, for review).

### *Fifty-four-month Emotion Self-regulation and First-grade Academic Achievement*

In addition to greater access to social partners, social dominance theory has posited that more effective resource control should provide greater access to all environmental resources (Hawley, 1999). In school, learning opportunities are, perhaps, the most important environmental resource. Thus, it seems reasonable to posit that the prosocial resource control strategies that helped well regulated children access social resources more effectively would also facilitate access to academic resources. Research tends to confirm this association. McClelland and colleagues (2006, 2000) have examined contributions of children's learning-related social skills to their academic achievement. They have defined learning-related social skills as manifestations of executive function, including "attention, memory, and inhibitory control" (McClelland et al., 2006, p. 472). From their two studies, they have reported that learning-related social skills in kindergarten were positively associated with kindergarten, first-grade, and 2<sup>nd</sup>-grade academic achievement. Similarly, Brody and Flor (1998) examined the association of African American elementary-school children's self-regulated learning and their academic achievement. They reported that children who were better able to set goals, understand consequences of their actions, and persist at difficult tasks had higher levels of academic achievement. These studies, like this study, lend support to Hawley's (1999) contention that successful resource control underlies peer group dominance. Taken together, these studies imply that, among their peers, well regulated children are likely to be academically dominant.

Additionally, this study's findings are consistent with prior research that has examined emotion self-regulation's association with academic achievement (Coplan et al., 1999; Fantuzzo et al., 2004; Howse et al., 2003a). For example, Howse and colleagues (2003b)

found that, among kindergarten and first-grade children considered at risk for school failure, emotion self-regulation was positively associated with achievement test scores, above and beyond contribution of prior achievement. Recently, Graziano and colleagues (2007) reported that kindergarteners' emotion self-regulation was positively associated with higher scores on standardized assessments of literacy and mathematics, with contributions of children's classroom behavior and relationships with their teachers controlled. Similar associations have been found using teacher' reports of academic achievement. For example, well regulated kindergarten children's teachers have rated them more academically competent than their less well regulated classmates (Fabes et al., 2003). Additionally, Opper (2003) has reported that well regulated preschool children are rated by their teachers as better at academic tasks, more likely to remember lesson content, and more academically capable than their less well regulated peers.

#### *First-grade Peer-related Social Competence and Academic Achievement*

Research has frequently demonstrated positive associations between children's social competence and academic achievement (Buhs & Ladd, 2001; Ladd & Burgess, 2001; Vandell & Hembree, 1994; Welsh et al., 2001; Wentzel, 1991). However, in this study, after accounting for the influence of 54-month emotion self-regulation, the association of first-grade peer-related social competence and first-grade academic achievement was no longer statistically significant. Thus, this study implies that this frequently-reported association may be misleading.

This study is not the first to report that positive peer relationships may not be crucial for academic achievement. For example, Cornell (1990) has reported that unpopular students were as academically capable as their better-liked peers. Additionally, Ladd and Burgess

(2001) have reported that positive peer relationships in the fall of kindergarten were not associated with children's spring academic achievement. From a more nuanced analysis of peer status and academic achievement, Wentzel (1991) reported that academic achievement was not the sole province of socially competent children. In Wentzel's study, popular and neglected students had similar high levels of academic achievement. Additionally, both average and controversial students were found to have moderate achievement levels. In fact, Wentzel reported that academic achievement suffered only among students who were actively rejected by their peers. These findings tend to indicate that children's academic achievement does not depend on peer-related social competence.

Recent ecologically oriented research also suggests a complex association between young children's social competence and their academic achievement (Estell et al., 2002; Farmer & Rodkin, 1996; Rodkin, Farmer, Pearl, & Van Acker, 2000). Estell and colleagues (2002) have described groupings of first grade children that show no definitive association between children's peer popularity and academic achievement. Their analysis revealed groups of popular, academically successful children and groups of children who were popular, but not academically successful. Similarly, Farmer and colleagues (1996) have found third-grade children at either end of the achievement spectrum to be well-liked by classmates. Taken together, these studies tend to indicate that social competence and academic achievement are not as strongly related as previously thought. This study offers evidence that, not only are peer-related social competence and academic achievement not strongly related, but they may represent separate outcomes of at least one underlying mechanism. Moreover, this study provides empirical evidence that emotion self-regulation may be one of those mechanisms.

*Limitations and Future Directions.* Other explanations for mediation analysis findings must be considered. In keeping with previous reports of analyses of NICHD SECC data which have statistically controlled for effects of children's gender, ethnicity, and family socioeconomic status (NICHD Early Child Care Research Network, 2001, 2003c, 2004a), this study also controlled for these child characteristics. In the mediation model, these effects were controlled in both social competence and academic achievement. The variance extracted by the control variables likely attenuated the variances of social competence and academic achievement. This attenuation would reduce the variables' association and could result in the non-significant association found in this study. This possibility suggests the importance of an analysis of a model in which the control variables are excluded.

Another possible explanation for the non-significant association found between peer-related social competence and academic achievement is that social competence was based solely on teachers' reports. Prior analyses of this association have often used peer-reported indicators of social competence (Ladd et al., 1999; Ladd et al., 1997; O'Neil, Welsh, Parke, Wang, & Strand, 1997; Vandell & Hembree, 1994). While teacher and peer reports are often correlated (Denham et al., 2003; Eisenberg et al., 2000; Raver et al., 1999), such reports are not identical. Thus, it is possible that the non-significant association between peer-related social competence and academic achievement is an artifact of teacher-reported indicators of social competence. This possibility suggests the importance of similar analyses using peer-reported indexes of social competence.

Further, neither teacher nor peer reports of social competence describe social networks in which children are embedded (Cairns, Xie, & Leung, 1998; Gifford-Smith & Brownell, 2003). Given that children's emotion self-regulation influences their social relationships

(Cumberland-Li et al., 2004; Denham, von Salisch, Olthof, Kochanoff, & Caverly, 2004), examinations of emotion self-regulation's association with children's social network membership has the potential to inform two research traditions. First, such studies could advance the understanding of emotion self-regulation's significance to peer relationships. Second, these studies could describe more fully the selection and socialization processes that underlie young children's social networks.

Additionally, the role of peer-related social competence in academic achievement may change over time. During the elementary school years, peer relationships are often based on similar behavioral dispositions and shared activities (LaFontana & Cillessen, 2002; O'Brien & Bierman, 1988; Zarbatany, Hartman, & Rankin, 1990). While younger children enjoy doing things with peers, it seems likely that they look to adults for support. In fact, research has suggested that elementary school children find more security in relationships with adults, rather than those with peers (Lynch & Cicchetti, 1997) and are more likely to seek help from adults than from peers (Furman & Buhrmester, 1992). Thus, the similarity of elementary-school-aged friends' academic achievements may reflect common learning-related behaviors and classroom activities, rather than peer support for achievement. If this is the case, the frequently reported association of social competence and academic achievement among young children (Buhs & Ladd, 2001; Ladd et al., 1997; Welsh et al., 2001) may be an artifact, rather than a benefit, of their peer relationships. On the other hand, adolescents select friends who share attitudes toward school and other normative activities, like dating and smoking (Hamm, 2000; Hartup, 1996). Additionally, adolescents, who talk with one another about their feelings and ideas (Youniss & Smollar, 1985), may be more likely to find support within peer relationships. Research has suggested that adolescents find more

security in peer relationships than in those with adults (Lynch & Cicchetti, 1997) and seek support from peers more frequently than from adults (Furman & Buhrmester, 1992). Thus, adolescent peer relationships, with their shared values and attitudes, have greater potential to encourage or undermine academic achievement than do the relationships of younger children. Over the school years, as students increasingly rely on peers for support, the role of peer-related social competence in the association of emotion self-regulation and academic achievement likely changes. Longitudinal analyses, similar to this study's mediation analysis, have potential to advance the understanding of the nature and importance peer relationships during development.

Despite its limitations, this study's mediation analysis makes contributions to research and theory. It lends support to prior research that has suggested the importance of young children's emotion self-regulation to their social and academic development (Bronson, 2000; Cole et al., 1994; Fantuzzo et al., 2003; Spinrad et al., 2006). However, this study did not support the often-reported association between peer-related social competence and academic achievement (Ladd, 1996; Ladd, Kochenderfer, & Coleman, 1996; Welsh et al., 2001). Rather, this study questioned this association, because it appeared to be an artifact of their common roots in emotion self-regulation. In fact, evidence from this study joins a growing strand of literature suggesting there may be no causal association between young children's social competence and academic achievement (Estell et al., 2002; Ladd & Burgess, 2001). Additionally, this analysis lends support to Hawley's (1999) theory that resource control abilities underlie social dominance. In addition to future research suggested by its limitations, this study also argues for the importance of longitudinal analyses examining the changing role of peer-related social competence in academic achievement.

### *Instructional Support and Emotional Support*

This study examined whether instructional support and emotional support changed emotion self-regulation's association with social and academic aspects of early school adjustment. The following sections will discuss findings from these analyses. First, moderation by instructional support will be discussed. Next, two analyses involving moderation by emotional support will be discussed. Each section includes connections to prior research. Limitations of the moderation analyses and the future directions they suggest are also discussed.

#### *Moderation by Instructional Support*

The first of this study's moderation analyses concerned the possibility that instructional support would moderate 54-month emotion self-regulation's association with first-grade academic achievement. Prior research has demonstrated that, in general, well regulated children have higher levels of academic achievement (Coplan et al., 1999; Howse et al., 2003a). However, while instructional support is generally important to children's learning (Case, 1979; Dolezal, Welsh, Pressley, & Vincent, 2003; NICHD Early Child Care Research Network, 2002), less well regulated children may not reap its benefits (Barry & Messer, 2003; Hamre & Pianta, 2005). For this study, instructional support was defined by effective classroom management, literacy instruction, evaluative feedback, instructional conversation, and child responsibility. This study's hypothesis was that instructional support would not moderate emotion self-regulation's association with first-grade academic achievement. Findings from this study supported the hypothesis. As anticipated, less well regulated children had lower levels of academic achievement than did their well regulated peers, across



the range of instructional support. In this analysis, instructional support did not moderate emotion self-regulation's association with academic achievement.

This study joins the burgeoning body of research that has sought to understand the effects of classroom type on children's learning. Stipek and colleagues (Stipek, Daniels, Galluzzo, & Milburn, 1992) have described three general types of classrooms, based on teachers' instructional methods. In one type of classroom, characterized by Stipek and colleagues as "didactic," teachers stressed academic skills and provided high levels of direct, academically-focused instruction. In another type, characterized as "child-centered," academic skills were deemphasized and direct instruction was infrequent. Finally, "intermediate" classrooms fell between the others. Subsequently, Stipek and colleagues (1998, 1995) examined associations of two classroom types and children's academic achievement. From the earlier study comparing preschool and kindergarten children's learning in didactic and child-centered classrooms, they reported children's literacy achievement in more didactic classrooms was higher than that of children in more child-centered classrooms, but there were no differences in mathematics achievement related to classroom type (Stipek et al., 1995). Additionally, these effects were the same for kindergarten and preschoolers, and for children regardless of their family financial resources. From the later study, however, Stipek and colleagues (Stipek et al., 1998) reported that, when compared to didactic classrooms, child-centered classrooms were associated with higher mathematics and literacy achievement among preschoolers, but with lower mathematics and literacy achievement among kindergartners. Following a group of kindergarten participants into first grade, they found that the children's first-grade mathematics achievement was higher among children in child-centered classrooms for two years, but first-grade literacy was higher among children in didactic

classrooms for two years. More recently, Morrison and Connor (2002) examined the benefits of didactic literacy skill instruction and child-centered literacy instruction. They found that, in general, children who began first grade with vocabulary and decoding scores in “the 25<sup>th</sup> percentile or below of the test norms” (p. 496) had higher end-of-year decoding scores when they received more didactic instruction and lower scores when they received more child-centered instruction. However, high levels of didactic instruction early in the year followed by increasing levels of child-centered instruction led to similar end-of-year scores. In contrast, children who began school with relatively high vocabulary and decoding scores benefited from consistently high levels of child-centered literacy instruction. Finally, Hamre and Pianta (2005) reported that, while high levels of direct instruction were beneficial to the academic achievement of children of less well educated mothers, no similar benefits accrued to children who began with few school-readiness academic and social skills (Dickinson & McCabe, 2001; Lewit & Baker, 1995; Rimm-Kaufman et al., 2000). In the light of these studies, it seems reasonable to suggest that further research might profitably consider the differential benefits of didactic and child-centered classrooms for groups of children.

For example, this study’s findings are consistent with special education research that has examined classroom instruction’s effect on less well regulated children’s academic achievement. This research has focused on children with AD/HD. Children with AD/HD are clinically identified as having difficulty controlling attention and inhibiting behavior in contextually appropriate ways (American Psychiatric Association, 1994). Usually not identified until elementary school, AD/HD has been associated with learning difficulties (American Psychiatric Association, 1994, pp. 82 - 84). Recent research indicates that teachers can support learning for students with AD/HD by teaching them to monitor and

manage their own behaviors and academic performance (Barry & Messer, 2003; Sthimabukuro, Prater, Jenkins, & Edlen-Smith, 1999). In essence, these strategies are designed to improve children's emotion self-regulation by actively teaching attention control and behavioral inhibition. It seems reasonable to suggest that such strategies would also be efficacious for any child who has difficulty controlling attention and managing behavior (Bronson, 2000; Zimmerman, 2005). While instructional support as defined in this study may be effective in well regulated children's academic achievement, they are not the specific strategies that research has found to support learning among children who experience difficulty controlling attention and inhibiting behavior.

#### *Moderation by Emotional Support*

This study included two moderation analyses in which emotional support was the presumed moderator. Emotional support was defined by teacher sensitivity, teacher intrusiveness (reversed), teacher detachment (reversed), classroom overcontrol (reversed), classroom positive emotional climate, and classroom negative emotional climate (reversed). In the first of these analyses, emotional support was examined as a possible moderator of 54-month emotion self-regulation's association with first-grade peer-related social competence. In the second, emotional support was examined as a possible moderator of 54-month emotion self-regulation's association with first-grade academic achievement. These analyses are discussed below.

##### *Fifty-four-month emotion self-regulation and first-grade peer-related social competence.*

The second of this study's moderation analyses examined whether emotional support moderated 54-month emotion self-regulation's association with first-grade peer-related social competence. Prior research has demonstrated that, in general, well regulated children are

more socially competent (Denham et al., 2003; Eisenberg et al., 2004b). Additionally, research has suggested that children are more likely to engage in positive social interactions when classrooms provide high levels of emotional support (Pianta & Nimetz, 1991; Rimm-Kaufman et al., 2005). This study's hypothesis was that, in high emotional support classrooms, less well regulated children would demonstrate peer-related social competence commensurate with their peers'. However, findings from this study did not support this hypothesis. Contrary to expectation, less well regulated children were found to have lower levels of peer-related social competence than their well regulated peers, across the range of emotional support. In this analysis, emotional support did not moderate the association of emotion self-regulation and peer-related social competence.

Again, this study's findings are consistent with prior special education research that has examined the effect of classroom practices on less well regulated students' social competence. Like AD/HD, learning disabilities have been associated with difficulty controlling attention (Mayes, Calhoun, & Crowell, 2000; Zera & Lucian, 2001) and inhibiting behaviors (Handwerk & Marshall, 1998). In general, research suggests that adults and peers rate children with learning disabilities (see Kavale & Forness, 1996, for review) and those with AD/HD (see Stormont, 2001, for review) as less socially competent. More importantly, research has suggested that social skills instruction is often necessary for these children. Helping children correctly identify their own emotions and those of others (Court & Givon, 2003), teaching and rehearsing appropriate problem-solving strategies (Court & Givon, 2003; Pavri & Monda-Amaya, 2001), and consistently reinforcing appropriate behaviors (Pavri & Monda-Amaya, 2001; Stormont, 2001) have been found to improve social competence among children with learning disabilities and/or AD/HD. Thus, sensitive

teachers, who maintain positive emotional climates in their classrooms, may facilitate positive peer relationships among most children, but likely do not provide the intense social skills instruction and reinforcement necessary for less well regulated children's social competence.

*Fifty-four-month emotion self-regulation and first-grade academic achievement.* The final moderation analysis examined whether emotional support moderated 54-month emotion self-regulation's association with first-grade academic achievement. Prior research has demonstrated that, in general, well regulated children have higher academic achievement (Howse et al., 2003b; Martin et al., 1988). However, research has also suggested the importance of emotionally supportive teachers to children's academic achievement (Birch & Ladd, 1996, 1997). This study's hypothesis was that less well regulated children would have higher academic achievement in high emotional support classrooms. Emotional support was found to moderate emotion self-regulation's association with academic achievement. Contrary to expectation, however, less well regulated children's academic achievement was lower in high emotional support classrooms than in low emotional support classrooms.

Findings from this study differ from those of recent ecologically oriented research. Like this study, Hamre and Pianta (2005) examined emotional support's role in children's academic achievement using NICHD SECC data. They reported that, when 1<sup>st</sup> graders categorized "at high functional risk" (p. 955) were in high emotional support classrooms, their academic achievement was similar to that of their peers. The divergence of this study's findings from those of Hamre and Pianta may result from sample and measure differences. The two studies had different participant selection criteria. Hamre and Pianta's sample (n = 910) (p. 954) included all children with complete data on variables of interest who were in

their second years of school. This study ( $n = 740$ ) included data from a single child in each full-day, first-grade classroom of more than 10 students. Additionally, Hamre and Pianta defined children's risk status by CPT attention control, and kindergarten teachers' reports of social skills, academic competence, and externalizing behavior problems. This study defined emotion self-regulation by CPT attention control, DOG behavioral inhibition, and CBQ attention control and behavioral inhibition. Additionally, Hamre and Pianta included classroom management as an index of emotional support in addition to the six indexes used in this study. It seems reasonable, therefore, to posit that the discrepant findings resulted from sample differences and differences in child- and classroom-level measures.

From a slightly different perspective, Baker (2006) examined whether child characteristics moderated close teacher-child relationship's positive association with elementary school children's academic achievement. She reported that, in general, close teacher-child relationships were associated with children's reading achievement in first through fifth grade. Baker also reported that this association was moderated by children's externalizing and internalizing behavior problems, but not by their learning problems. Children with high levels of behavior problems did have higher academic achievement when they had close relationships with their teachers. However, their achievement was less affected by increases in teacher-child closeness than was the achievement of children with low behavior problem levels. Moreover, even when children with high levels of behavior problems enjoyed very close teacher-child relationship, their academic achievement was generally lower than that of low problem-behavior peers who did not have a close relationship with their teachers. Among children with learning problems, Baker found that academic achievement was unaffected by teacher-child relationship quality. Needless to say, the consistently low

academic achievement of children with learning problems was lower than that of children without such problems across the range of teacher-child relationships. These complex findings tend to indicate that, in general, close teacher-child relationships may provide more support for academic achievement among children who successfully manage their own behaviors. Additionally, Baker's findings tend to imply that close teacher-child relationships provide little benefit for children with learning problems. The lack of convergence among these studies and this study may result from construct, variable, and sample differences. However, this divergence may also arise from the complexity of ecological models. These divergent findings, along with this complexity, argue for further research examining interactions among child and classroom characteristics associated with children's early school adjustment.

This study's findings stand in opposition to findings of prior research. Rather than finding that emotional support facilitated less well regulated children's academic achievement, post hoc analysis showed the reverse. Across the range of emotion self-regulation, emotional support was inversely associated with academic achievement. Moreover, emotional support's negative influence on academic achievement increased as emotion self-regulation decreased. High levels of emotional support were more deleterious for less well regulated children's academic achievement than for that of their well regulated peers. These antithetical post hoc findings require further consideration

In this study, emotional support generally had a greater effect on less well regulated children's academic achievement. However, rather than facilitating such children's academic achievement, increasing emotional support appears to have diminished it. This unexpected finding may lend support to Kauffman and McGee's (2004) model of student

learning. Kauffman and McGee have suggested that teacher tolerance and accommodation of student diversity may reduce academic learning. Although their model specifically addressed issues of special education, it seems equally applicable to less well regulated children in mainstream classrooms. They argue that as teachers try to eliminate failure for students who are having problems at school, they often reduce school's academic challenges and demands. In doing this, teachers deny struggling students "the opportunity to succeed" (p. 618). Kauffman and McGee have argued that, under these conditions, children fail to learn academic skills and may come to doubt their own academic abilities. From this perspective, teachers who provide high levels of emotional support for less well regulated children may limit academic challenges and learning opportunities for those children. In turn, such limitations would curtail the children's access to learning experiences, thereby diminishing their academic achievement. Additionally, if teachers limit academic challenge and demand for less well regulated, struggling learners, these children may infer that their teachers have lower expectations for them than for other students. Such an inference may become a self-fulfilling prophecy (Merton, 1948) and may underlie learned helplessness (Dweck & Licht, 1980) among less well regulated children. Thus, limited academic challenges and curtailed learning opportunities may be a mechanism by which emotional support diminishes less well regulated children's academic achievement. Future research examining differential affects of classroom practices on students' self-beliefs, motivation, and engagement may clarify how teachers may unwittingly undermine the learning process among some students.



### *Limitations and Future Directions*

Limitations of this study's moderation analyses are related to instructional and emotional support indexes. In general, classroom observations took place during the first three hours of one instructional day (NICHD Early Child Care Research Network, 2002). Each index was a global rating recorded every ten minutes during the observation time, generally by a single observer. Gold standard videotape test Pearson correlation reliabilities based on 181 pairs of raters were 0.72 for classroom overcontrol, 0.30 for positive emotional climate, and 0.54 for negative emotional climate. Gold standard reliabilities for teacher sensitivity, intrusiveness, and detachment are not available. Pearson correlation live interrater reliabilities based on dual observations of 46 classrooms, ranged from 0.55 to 0.88 (mean = 0.74). Because gold standard reliabilities were low or not available and live reliabilities were provided for only a small subset of classroom, it is not possible to assess the reliability of these indexes across the 710 classrooms represented in this study (Crocker & Algina, 1986, p. 143).

Additionally, means of all emotional support indexes were relatively high. Means of two instructional support indexes were also relatively high (see Table 4.1). Relatively high scores such as these could represent systematic variance that may have compromised the validity of these data (Kerlinger & Lee, 2000, pp. 642 - 643)

It is also possible that, because classrooms were observed only once, instructional and emotional support indexes did not accurately assess usual, day-to-day classroom supports. While factor analysis found instructional and emotional support indexes loaded on two separate latent variables, this is not sufficient evidence that they accurately represent usually available supports. In this case, instructional and emotional support indexes may not have measured what they intended to measure and, thus, may not be valid measures (Kerlinger &

Lee, 2000). Multiple classroom observations could have provided evidence of consistency over time.

Finally, observer reports may accurately reflect usually available classroom supports, but still not reflect children's perceptions of those supports. This seems more likely for emotional support indexes than for instructional support indexes. Instructional support indexes reflect academic teaching practices. These indexes likely rely less on observers' subjective judgments than do emotional support indexes. Adult observers' perceptions of emotional support may be quite different from those of young children. It seems likely that children's early school adjustment is affected by their own perceptions of and reactions to school (Alexander & Entwisle, 1988; Ladd, Buhs, & Sied, 2000). If indexes of emotional support did not reflect children's perceptions, they may not provide valid emotional support data (Kerlinger & Lee, 2000). Convergence of observer and child reports could help establish validity of this indexes (Crocker & Algina, 1986, pp. 230 - 235).

Despite its limitations, this study's moderation analyses contribute to research and theory. They provide preliminary empirical evidence that less well regulated children may have difficulty learning in typical first-grade classrooms. This study's findings imply that well-organized instructional presentations, including individual instructional conversation and evaluative feedback, may not meet the learning needs of less well regulated children. Additionally, this study offers preliminary empirical evidence that less well regulated children may need more than a warm, caring teacher if they are to be socially competent at school. Finally, the unexpected post hoc finding suggesting that emotional support may be detrimental to less well regulated children's academic achievement raises new questions. Why does emotional support have a deleterious effect on less well regulated children's

academic achievement? Are there qualitative differences in the emotional support teachers provide for well regulated children and for less well regulated children? If so, what are these differences? Do less well regulated children perceive emotional support differently than do their well regulated peers? Do emotionally supportive teachers limit academic demands and learning opportunities for their less well regulated students? Each of the questions can guide further research that has potential to clarify emotional support's role in children's early school adjustment. Finally, the preliminary nature of this dissertation study's analyses encourages further studies that may confirm or question these findings. As part of a burgeoning ecologically oriented research tradition, this study's analyses contribute to the understanding of some of the proximal processes that Bronfenbrenner (1979) described as the primary mechanisms of development and encourages future research that will continue examining the nature of children's early school adjustment.

#### *General Limitations and Future Directions*

Specific limitations, and the future research they suggest, have been discussed previously. In addition, there are other possible avenues of investigation which should be considered, This study was predicated on that assumption that child- and classroom-level influences on early school adjustment did not vary by gender, ethnicity, or family background. Prior research has shown that this may not always be the case (McIntyre, 1996; McLoyd, 1998; Ruble, Martin, & Berenbaum, 2006). The influences of emotion self-regulation and classroom supports on early school adjustment may be affected by children's gender, ethnicity, and family background. These possibilities are discussed below.

As children begin school, their gender-related beliefs, perceptions, and behaviors seem to be less flexible than at any other time of development (Ruble et al., 2006). This general

inflexibility of attitudes and behaviors may result in gender-related differences in social and academic aspects of early school adjustment. As children begin school, most prefer relationships with same-sex peers (Ruble et al., 2006; Strayer & Santos, 1996). Within the context of same-sex peer relationships, girls' and boys' school experiences are likely very different. Girls' relationships, often conducted in proximity to adults, frequently involve sedentary activities marked by conversation and cooperation. Boys, on the other hand, are more likely to engage in rough and tumble play, seek dominance among peers, and avoid adult-supervised areas (Ruble et al., 2006). Thus, girls' quieter, generally affiliative interactions may rely less on emotion self-regulation than does boys' active, competitive play (Blair, Denham, Kochanoff, & Whipple, 2004). Also, the nature of girls' relationships may encourage more school-appropriate behaviors and provide a support system for school adjustment not included in boys' relationships. Additionally, gender-related differences in language development (Ruble et al., 2006) may differentially tax children's emotion self-regulatory abilities in ways that affect their abilities to succeed at school. Generally more verbally competent, girls may understand classroom instruction and directions more readily than do boys. Girls may also be better able to communicate their knowledge and elicit additional assistance when necessary. Thus, girls' verbal skills may lead to lower levels of frustration, greater academic achievement, and more positive classroom interactions, thereby making fewer emotion self-regulatory demands than those experienced by boys. Finally, differences between girls' and boys' classroom experiences, including their relationships with teachers (Hamre & Pianta, 2000; Howes, Phillipsen, & Peiser-Feinberg, 2000) and teachers' gender-specific instructional practices (Bailey, 1993; Sadker, 1999) may moderate associations of child characteristics. For example, Hamre and Pianta (2000) have reported

that conflictual and dependent teacher-child relationships were deleterious to boys' school adjustment, but not to girls'. They have also reported that girls' achievement was higher in the context of close teacher-child relationships, but boys' was not. It seems reasonable, therefore, to suggest that associations among emotion self-regulation, peer-related social competence, and academic achievement may be gender-specific. Additionally, instructional support and emotional support may affect these associations differently for boys and girls.

As children enter school, they bring diverse, culturally-influenced learning styles to their classroom experiences (Garcia & Malkin, 1993). The dissonance between typical classroom practices and ethnic minority children's learning styles may underlie their disproportionate representation in special education placements (McIntyre, 1996; Miller, 1995; U. S. Department of Education, 2002). Research suggests that children of color may have learning styles that are not compatible with the instruction they encounter at school (Boykin & Allen, 1999; McIntyre, 1996). In the classroom, children of color are generally more physically active, verbally responsive, and exuberant than their white classmates (McIntyre, 1996), leading teachers to describe them as less attentive and more disruptive (McIntyre, 1996; Rabiner, Murray, Schmid, & Malone, 2004). Children's attention control and behavioral inhibition develop within their home cultures (Calkins, 1994) and are likely adaptive for those environments. When children begin school with learning styles that are at odds with classroom expectations and instructional practices, they likely face greater emotional and cognitive demands than those encountered by children who do not experience such discrepancies. To support learning among children of color, teachers may need to recognize these learning styles as different rather than as deficient, diversify instruction to meet multiple learning styles, and, perhaps, contradict their own socialization for the benefit of

their students (Ballenger, 1999, p. 37). Ladson-Billings (1994) has argued persuasively for the importance of culturally-responsive teaching practices in African American children's social and academic school adjustment. Thus, it is important to examine moderating influences of culturally-responsive instructional and emotional support on emotion self-regulation's association with early school adjustment, especially among children of color.

Finally, research has frequently suggested associations between children's family backgrounds and their adjustment to school (see McLoyd, 1998 for review). However, research has demonstrated that emotion self-regulation's contribution to academic achievement remains significant above and beyond the contributions of family background (Coplan et al., 1999; Howse et al., 2003b; Miech et al., 2001). For example, Coplan and colleagues (1999) reported that, after controlling for influences of parents' education levels, fall reports of children's attention regulation were positively associated with spring measures of academic achievement. In a series of analyses, Miech and colleagues (2001) examined emotion self-regulation's role in socioeconomic status' associations with social and academic aspects of school adjustment. They found that emotion self-regulation mediated, but did not moderate these associations. These findings tend to indicate that children's emotion self-regulation may be a mechanism by which family background wields its long acknowledged influence on children's early school adjustment. Thus, a more clear understanding of the processes underlying socioeconomic differences in emotion self-regulation may be crucial to children's early school adjustment. Such research has the potential to inform practice and policy related to supports for families of children at risk for poor school adjustment. Additionally, defining effective classroom supports for at-risk children during the transition to school may facilitate successful school adjustment for more children.

The limitations of this study argue for future research investigating the effects of gender and ethnicity on the associations examined in this dissertation study. Additionally, these limitations suggest the importance of a better understanding of family background's influence on emotion self-regulation and of classroom supports that may help at-risk children succeed during the transition to school. Examinations of gender, ethnicity, and family background influences have the potential to provide greater empirical and theoretical understandings of children's early school adjustment and to inform classroom practices in ways that support the learning of all children.

### *Practical Implications*

While it was not the purpose of this dissertation study to speak directly to parenting, child care, and early education practices, it does have implications for all of these. First, the importance of children's emotion self-regulation to their early school adjustment can not be over-stated. Above and beyond the contributions of children's gender, ethnicity, family background, and preschool cognitive abilities, 54-month emotion self-regulation appeared to influence first-grade peer-related social competence and academic achievement. As Calkins (1994) has posited, emotion self-regulation, rooted in children's physiological temperament, develops in the context of adult-child interactions (Bronson, 2000; NICHD Early Child Care Research Network, 2004b; Pianta & Nimetz, 1991; Sroufe, 1997; van den Boom, 1994). Providing parents, caregivers, and teachers with specific strategies and techniques shown to support emotion self-regulation development may engender better self-regulatory skills for many children. Additionally, teachers and others working with less well regulated children must be prepared to teach necessary self-regulatory skills so that these children can succeed at school (Brigman, Lane, Lane, Lawrence, & Switzer, 2001; Linares et al., 2005).

Second, in the context of the mediation analysis, this dissertation study did not support the importance of peer-related social competence to first-grade academic achievement.

However, if children are to work and play well with peers, social competence is important.

Thus, parents, caregivers, and teachers must model and teach socially appropriate behaviors that will facilitate children's inclusion in peer activities (Bronson, 2000). There is little doubt that the skills that support children's social inclusion are often those of emotion self-regulation (Denham et al., 2004; Halberstadt et al., 2001).

Finally, this dissertation study's moderation analyses underscore the importance of children's emotion self-regulation to their early school adjustment. Neither instructional support nor emotional support, as assessed in this study, facilitated less well regulated children's early school adjustment. In fact, high levels of emotional support appeared to be deleterious to less well regulated children's academic achievement. With this in mind, it seems reasonable to suggest that during the early school years teachers establish rules and procedures that support engagement in learning-related activities, structure classroom activities to facilitate self-regulation, and provide and scaffold appropriate learning-related activities (Paris & Paris, 2001; Perry, VandeKamp, Mercer, & Nordby, 2002). Above and beyond these usual classroom practices, less well regulated children likely need help breaking large tasks into smaller sections, prioritizing work, and learning to monitor their own progress. Giving less well regulated children abbreviated assignments, highlighting central ideas, encouraging self-talk, and teaching specific strategies for classroom participation and learning may be crucial for their learning (Child Development Institute LLC, 2006; Harris, Friedlander, Saddler, Frizzelle, & Graham, 2005).



## *Conclusion*

This dissertation study examined the role of children's 54-month emotion self-regulation and classroom supports in social and academic aspects of early school adjustment. Like prior research, this dissertation study sought child and environmental characteristics associated with early school adjustment. Additionally, it sought mechanisms by which these characteristics influenced school adjustment during the transition to school.

Well regulated preschool children were found to become socially competent and academically successful first-graders. These findings serve to reinforce the reports of early-grade teachers. Children's abilities to follow directions and participate cooperatively in classroom activities are more important to early school adjustment than are basic academic skills (Lewit & Baker, 1995; Rimm-Kaufman et al., 2000). This dissertation study also found that peer-related social competence did not provide a mechanism by which emotion self-regulation influenced academic achievement. This finding calls into question theory concerning the importance of young children's peer relationships to their early academic achievement (Ladd et al., 2004) and requires further examination.

Ecological theory (Bronfenbrenner & Morris, 1998; Rimm-Kaufman & Pianta, 2000) and prior research (Pianta et al., 2002; Rimm-Kaufman et al., 2005) have supported the importance of classroom processes in children's school adjustment. However, the two classroom supports examined in this dissertation study did not change the generally positive association of emotion self-regulation and early school adjustment. Regardless of instructional support level, well regulated children had higher academic achievement than did their less well regulated peers. Additionally, regardless of emotional support, well regulated children were more socially competent than their less well regulated peers. Emotion self-

regulation's association with academic achievement remained positive across all levels of emotional support. However, higher levels of emotional support were associated with lower levels of academic achievement, especially for less well regulated children. While positive teacher-child relationships have often been associated with children's learning (Birch & Ladd, 1997; Pianta et al., 2002), this dissertation study's findings imply that teacher sensitivity and positive emotional classroom climate may have unexpected, deleterious effects on less well-regulated children's academic achievement.

Taken together, the findings of dissertation study have contributed new knowledge concerning the influences of child characteristics and classroom supports on early school adjustment. First, by examining the joint influence of emotion self-regulation on social and academic aspects of early school adjustment, this dissertation study has stressed the importance of emotion self-regulation to early school adjustment and provided support for Hawley's (1999) theory of social dominance, while questioning the role of peer relationships in early academic achievement. Second, this dissertation study's findings indicated that classroom supports, as assessed in this dissertation study, did not improve less well regulated children's early school adjustment. These findings indicated that emotional support may have an adverse effect on less well regulated children's academic achievement. In fact, this dissertation study's findings argue that, to succeed socially and academically during the transition to school, less well regulated children may need explicit instruction to acquire the necessary self-regulatory skills, both peer-related and learning-related, that support early school adjustment. By describing more fully children's pathways to early school adjustment, this dissertation study has contributed to scholarly understanding of the complex nature of

early school adjustment and opened new avenues of investigation with potential to further extend this understanding.

## APPENDIX

### Exploratory Factor Analysis of COS-1 Observed Teacher and Classroom Variables

Prior to factor analysis, the data were screened for multivariate outliers. There were 45 cases with no COS-1 data. Of the remaining 695, 23 cases had Mahalanobis' Distances greater than the critical value (critical value  $\chi^2_{11} = 31.26, p = .001$ ). Examination of Mahalanobis' Distance distribution revealed a discontinuity between the ultimate and penultimate scores. Thus, there was only potentially problematic case. It was considered unlikely that this case would affect the analysis. Nonetheless, principal components analyses (SPSS 14.0) were conducted for the complete data set and a reduced data set.. These analyses indicated little difference. Although eigenvalues and scree plots suggested the two factor solution (Table A1), three factor solutions were also considered

The orthogonal and oblique two-factor solutions were interpretable and similar. These solutions are discussed further below. The orthogonal three-factor solution had items which loaded similarly on more than one factor making interpretation difficult. The third factor of the oblique three-factor solution had only three items with loadings greater than 0.30 (Stevens, 2002, p. 440), the smallest of which loaded more heavily on the first factor. Neither of these solutions was considered adequate.

The two-factor orthogonal and oblique solutions revealed similar factors. In the orthogonal solution, all factor loadings exceeded 0.50. There were two items (teacher sensitivity and classroom positive emotional climate) with loadings exceeding 0.50 for each factor. However, both items loaded more strongly on factor one. In the oblique solution, all factor loadings exceeded 0.45. There were items (teacher sensitivity and classroom positive

emotional climate) with loadings exceeding 0.30 for each factor. However, both items loaded more strongly on factor one. The orthogonal solution factor matrix and the oblique solution pattern matrix are presented in Table 3.3 (p. 62).

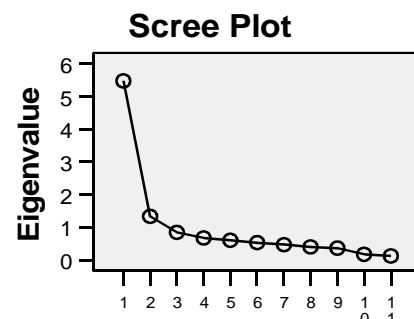
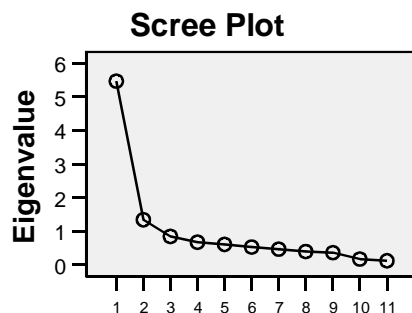
Factor one was interpreted as emotional support. The items defining this factor are indicators of teachers' sensitivity and responsiveness to children's needs and classroom emotional climate. Factor two was interpreted as instructional support. The items defining this factor are indicators of instructional quality and children's responsibility for their work.

Table A.1.

Exploratory factor analysis two-factor solution indexes

	Complete data set (n = 695)	Reduced data set (n = 694)
KMO	0.881	0.882
measure of sampling adequacy		
Bartlett's Test of Sphericity (55df)	4279.72	4283.56
Total variance explained by initial eigenvalues greater than 1	<u>Component 1:</u> total 5.47, % variance explained 49.68. <u>Component 2:</u> total 1.34 % variance explained 12.11.	<u>Component 1:</u> total , 5.48, % variance explained 49.80 <u>Component 2:</u> total 1.34 % variance explained 12.15.

Scree plots



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